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Medical Topography.

From the "Natural and Statistical View, or Picture of Cincinnati and the Miami Country."

BY DANIEL DRAKE. CINCINNATI, 1815.

UNDER this head it is proposed to communicate, as fully as possible, such information concerning our diseases, and such notices of the mineral springs within our reach, as a person about to emigrate to the western country would desire.

SECTION 1. *Prevailing Diseases.*

Of the diseases connected with climate, we have most of those which are common in the same latitudes, east of the Alleghenies. Some of them, however, are less violent and frequent here than there. Of this kind is the *pulmonary consumption;* which, in the Atlantic cities, destroys from a fourth to a sixth of all who die; while in this town, it produces not more than one-twentieth of the deaths. So favourable, indeed, is this place to those who are threatened with consumption, that a migration to it from the northern states might be advantageously recommended, when this complaint is about commencing, or not very far advanced. The *pleurisy* and *peripneumony* occur every winter; but seldom prevail to any great extent. They are generally complicated with bilious affections; which

renders the treatment difficult, and makes the use of calomel, in most cases, absolutely necessary to a successful issue. The *croup* is a formidable disease in this place, annually carrying off a number of children. Like the preceding complaints, it is frequently attended with bilious symptoms; and occasionally shows itself in connexion with cholera infantum, forming a very dangerous combination. In general, it does not seem to be a worse malady here than in the east; and I have never seen it of that malignant and epidemic character at Cincinnati, which it exhibited in Virginia in 1799.* *Colds* and *catarrhs*, *swelled tonsils*, *and other affections of the throat*, produced by sudden changes of weather, occur here in the same manner as in the maritime states; but do not appear to be so often followed by consumption. The *premature decay of the teeth*, *pains in the jaw*, *and tooth ache*, frequent in all variable climates, are, it would seem, much less common here, than in some parts of New England; as Dr. Hazletine informs us, that they make about an eighth part of all the diseases incident to the people of the province of Maine. *Rheumatism* occurs; but is not so frequent and formidable as in the northern states.

Of the diseases ascribed to the exhalations from putrefying animal and vegetable substances, from alluvial ground, and from ponds and marshes, we have perhaps the whole catalogue, with the exception of the yellow fever of the eastern cities. In the country, especially along the water courses, *remitting* and *intermitting fevers*, including *ague*, prevail every autumn; but are seldom malignant, and generally yield to the treatment elsewhere employed, if resorted to at an early period. In Cincinnati, the annual prevalence of these diseases is less certain, and the *mild* and *malignant typhus fevers* frequently supply their places. In the years 1809, 1810 and 1811, these complaints were prevalent here, without much intermission; but since that time they have been rare.

The diseases to which immigrants are most liable, are bilious and typhus fevers. This is especially the case with the natives of New England and New York, who in coming here undergo a change of climate greater than they seem generally to suppose. They should, therefore, endeavour to arrive in the

* See Medical and Physical Journal, vol. ii.

Miami country late in the autumn; and before the ensuing summer, place themselves in the most healthy situations which can be found. Those who intend to reside in the country, should get on upland farms at an early period: those who prefer the town, should choose the eastern and northern portions, which are more exempt from noxious effluvia; and, in the heat of summer and early autumn, expose themselves as little as possible, either to the evening air, or the noon day sun. With these precautions, and a strict regard to the prevention of what is denominated a bilious habit, very few will suffer an attack; but without such attention, *a seasoning*, as it is termed, will most likely be experienced the first summer after an arrival from the north. In the second, whether the first be sickly or not, there is but little danger.

Next to our fevers, are the different complaints of the stomach and bowels. These prevail chiefly in the summer, as in other parts of the United States, and precede the fevers which have been enumerated. The *cholera infantum* is commonly the first which occurs, and sets in with the earliest intense heat. Its greatest prevalence is in June and July, when it frequently proves fatal, particularly in town. It sometimes destroys life in a few days; at other times the unfortunate little sufferer pines for several weeks, when he eitheir dies, or is restored by the frosts of autumn. In the country this disease is less frequent, and so mild as not often to prove fatal. The *cholera morbus* occasionally presents itself, at the seasons in which it is more or less prevalent over all the states. A few cases of *dysentery* occur every summer; and once in two or three years, it is epidemic. When this is the case, its prevalence is sometimes very general, but not often mortal. Now and then it assumes a malignant character; when it is, for the most part, confined to a single family. Upon the whole, this disease appears to be less formidable in this country, than in the Atlantic states. On the head waters of the Great Miami, and in some of the adjoining parts of Kentucky, a disease called by the people the *sick-stomach*, has prevailed more or less for several years. Its prominent symptoms are, a vomiting upon taking exercise, with chronic debility, lassitude and soreness of the extremities. Sometimes it continues for months, in the same individual; and frequently affects whole families. It is supposed to extend

to horses, cows, sheep and dogs, varying in several of its symptoms. It does not often prove fatal; and the people, where it is endemic, seem to have learned by experience an efficacious method of treatment. It has been ascribed to some noxious impregnation of the water; to the use, by the animals whose milk and flesh are eaten, of some deleterious plant, and to marsh exhalation—the last of which is the most plausible. For two or three years past, its occurrence has been more infrequent, and it cannot be regarded as constituting any serious objection to the districts in which it prevails. The *jaundice* is a pretty common disease in this country; but it seldom destroys life. *Inflammation of the liver* is met with occasionally, but not oftener than in the same latitudes of the maritime states. Sore eyes (*ophthalmia*) is a disease which now and then becomes epidemic over the whole of this country. It prevails most in the same situations where the ague, and other forms of bilious fever abound; and has therefore been referred to the same cause. It does not arise from heat or dust, as it occurs oftenest in shady vallies; nor from the smoke of autumn, as it precedes that phenomenon. It is less frequent than formerly, and will perhaps cease with those diseases which are acknowledged to depend on marsh exhalation. The *periodical head-ach* is a disorder which in this country is ascribed to the same cause, and can be cured in the same manner as ague and fever.

Of the diseases termed *epidemic*, the most frequent in the Miami country are the *measles* and *hooping cough*, both of which have prevailed in Cincinnati every year or two, since 1800. They seldom affect a great number at once, but make their attacks successively for many months, and do not often terminate fatally. The *mumps* now and then occur, with no unusual symptoms. The *small pox* has not prevailed here to any extent for a dozen years. There is no institution for preserving and disseminating the vaccine virus; but a great number are annually vaccinated. The *scarlet fever* and *putrid sore throat* have been of rare occurrence. About the year 1792, they were prevalent in all the infant settlements of the west, and produced many deaths. From that time till 1809, but few cases were observed at Cincinnati. In this and the two subsequent years, they appeared in an epidemic form, and destroyed a number of children. Since that period, but few cases have

been seen, and those were of the mildest kind. The *influenza*, so extensively prevalent in 1807, attacked the people of Cincinnati about the 1st of October, and disappeared in five weeks, leaving the town unusually healthy. Very few adults of either sex, but many children, escaped it. The number of deaths produced by it was inconsiderable. The consumption, however, followed in its train, and carried off several persons in the two ensuing years. Since this visitation, we have more than once experienced wide spreading *catarrhs*, which were ascribed to changes of the weather; but it seems probable that they arose from the same causes with the *influenza*. The *spotted fever* of the northern states has never prevailed here; but its successor, the *typhoid pneumony* (vulgarly called in this country the cold plague) affected a very considerable number in the winters of 1812-13 and 1813-14. In that of 1814-15, but few cases were met with. More men, in proportion, than women or children, suffered; and it generally attacked those who were most exposed to cold and moisture. It proved fatal in a number of cases; but was, on the whole, productive of much less mortality than in the north.

Eruptive diseases of the skin are common in the Miami country, and frequently prove obstinate. The *itch*, and a breaking out which nearly resembles that complaint, are the most common. These eruptions, however, exhibit a great variety of appearance, and are by the people ascribed to as many different causes. They seem to be more prevalent in the country, than the town. *Worms* are common, and affect children of every age, from one to fifteen years. They seldom prove fatal, unless combined with some other disease. The *goitre* is an endemic of the western portions of Pennsylvania, and the eastern part of this state; but is unknown here, except in persons who have immigrated while labouring under it. The *scrophula*, *rickets* and *scurvy*, especially the two latter, are rare diseases. *Hysteria*, *hypochondria* and *insanity*, are not uncommon. *Dropsy of the brain* is met with occasionally. *Locked jaw* is so rare, that but a single case has occurred here for many years. *Apoplexy* is scarcely ever seen; but *epilepsy* is more frequent. *Dropsies* occur pretty often, but generally as the consequence of intermitting fever. The *gout* and *calculus* are seldom seen, and *palsies* are infrequent. *Cancers* are uncommon; and no case of

hydrophobia has occurred since the settlement of the town. *Canine madness* has not been epidemic for many years. The venomous snakes are so few, that even in the newer settlements a *snake-bite* is uncommon; and in the neighbourhood of Cincinnati, almost unknown. The *coup de soleil*, or stroke of the sun, and death from the use of *cold water*, are not more frequent. *Drowning* in the Ohio, is an accident which often happens, and one which we are entirely unprepared to remedy, not having the instruments necessary, either for the recovery of the immersed body, or the restoration of life.

As no bills of mortality are kept in this place, it is not known what proportion die annually; what diseases carry off the largest number; or which of the seasons is attended with the greatest mortality—though the two latter may be estimated and expressed in general terms. The cholera infantum is more fatal to children than any other complaint. It is most destructive in the second summer; aggravated, no doubt, by teething, and the miscellaneous food with which children begin to be indulged at that age. Convulsions, in the first month after birth, carry off many; and should perhaps rank next to the cholera infantum in the number of their victims. After this follows the croup, which for the most part attacks those between the ages of six months and two years. Of adults, the greatest number die with bilious and typhous fevers; with pulmonary inflammation, and with affections of the liver, stomach and bowels. In the months of June and July, more children die than in any others. The greatest mortality among adults is generally in August, September and October. When epidemics prevail, this however is otherwise, and the midst of winter is now and then attended with a greater number of deaths than any other part of the year.

Section 2. *Causes of Disease.*

CLIMATE.

Neither the extreme cold, nor the extreme heat of this climate, appears to produce many diseases, by its direct operation. If scurvy, goitre and chilblains arise from cold, that of our climate is not sufficient to produce them. The extremities of those who are much exposed in winter, are occasionally frozen; but there has been no instance of death from such ex-

posure in this country. The most obvious effects of our hot weather are, oppression and lassitude in the muscles, with a diminution of appetite—all of which disappear upon the occurrence of a cool day, and are thereby distinguishable from similar affections produced by marsh exhalation. Few persons escape these complaints; but those who have emigrated from higher latitudes are of course the greatest sufferers. Some aged people, and a few valetudinarians, enjoy better health in our hot, than cold weather. Our children, during the great heats of summer, are liable to *rashes*, as they are popularly called—cutaneous efflorescences—which are troublesome, but not dangerous; and disappear upon the first occurrence of cool weather. There is even reason to believe these affections salutary, as they frequently appear on the healthiest children. Cholera infantum is not produced by the direct action of heat on the system, but is so much aggravated by that cause, as to be generally incurable during the period in which the thermometer fluctuates between 76 and 96 degrees. The variations of atmospheric temperature are a more potent cause of disease, than either extreme. But they may in a great degree be rendered harmless, by a careful adaptation of clothing, lodging and fire, to the change. This cause usually produces pleurisy, rheumatism and other inflammations—colds, quinsies, croup, tooth ach, &c. uncombined with other complaints;—but when the prevailing disease is a bilious or a typhous fever, it is commonly found, that the affections produced by changes of the weather, partake largely of the symptoms of the epidemic. The best examples of this combination are afforded by the pleurisy and croup. Variations of temperature, particularly changes from *heat* to *cold*, are sometimes the *exciting* causes of intermitting and other fevers, produced by marsh exhalation. In all these cases, the presence of moisture renders the depression of temperature more injurious. To water, indeed, in the form of dew and fog, it is fashionable to ascribe much deleterious power; but there is reason, perhaps, to doubt the correctness of this hypothesis in all cases, when the temperature of the atmosphere is *steady*.—Fogs and vapors are most abundant, where the decomposition of vegetable matter is greatest; and to this operation should perhaps be attributed most of the diseases which are vulgarly ascribed to moisture.

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WATER.

Throughout the Miami country, this is generally *hard*, from holding in solution *carbonate of lime*, *muriate of soda*, *muriate of lime*, and the other salts afforded by a calcareous region. It is apt, therefore, to disagree with immigrants from a country, such as that east of the Alleghenies, where most of the springs afford *soft* water. The complaints excited by this cause are for the most part transient; and to the natives of the country, its waters are as salutary and pleasant, as those of the Atlantic states are to the inhabitants of that quarter. Our springs and wells cannot, therefore, be regarded as affording a beverage absolutely prejudicial to health, though it may operate injuriously on strangers for a short period.

MIASMATA.

The Miami country in general being level, ponds and morasses are frequent; especially in the northern part. Most of them might be drained, and certainly will be, at some future period. In the mean time, their environs must continue more or less infested with the diseases which spring from marsh effluvia; and therefore should not be selected for the residence of immigrants. Most of our valleys contain large quantities of alluvion, deposited at various antecedent periods; but whether from these tracts there be any exhalations still arising, which are noxious, is doubtful. The more obvious sources of miasmata, are the marshes formed in these tracts from the annual inundation of their lower portions; and the decaying remains of animals and vegetables deposited in the shores of the streams which flow through them. Whatever may be the truth on this point, it is certain that the valleys are less healthy than the uplands; but from clearing and cultivation, they are annually becoming more salubrious. With respect to Cincinnati, the sources of miasmata may be divided into those which are natural, and those which are artificial; or in other words, into such as are common to it, and other towns on the river, and such as are peculiar, and of our own creation. Of the former, we have but two—the drowned lands at the mouth of Mill creek; and the river beach opposite the town. The former lie so far to the west, and are so much disconnected with the

town by an intervening forest, that our summer winds but seldom blow their exhalations over us. Hence very little agency can be ascribed to this cause. The latter is, perhaps, more efficient. The great depressions of the Ohio, in August and September, expose to the sun a quantity of mud, with trees and some animal matter, in a state of decay; the exhalations from which are unquestionably prejudicial. The erection of the steam mill has augmented this cause; by producing, in high floods, an eddy, which annually deposits on the beach, for a thousand feet along the front of the town, a large quantity of filth and mud. Our *artificial* sources of disease are incomparably more deleterious. For many years the descent of gravel along the streets which run from the upper to the lower table, has kept several of the intermediate lots in a state of partial inundation, and caused them to accumulate large quantities of filth. Further west, in the same tract, nearly all the bricks hitherto used, were manufactured; and the pits whence the clay was dug, have been constantly receiving, through the gutter in Second Street, nearly all the wash of the town. Thus have we improvidently created, in the very midst of our population, the most offensive and destructive nuisances. Fortunately, the powers of the new corporation enable them to compel the removal or abatement of the whole. The great purification has thus at last been commenced; and although its progress as yet has neither been creditable to the energy of the corporation, honourable to the proprietors of those lots, nor beneficial to the public health, there is great reason to hope for relief at no remote period. When this salutary object is accomplished, our public sources of disease will be so few and inefficient, that we may, without hesitation, expect to see Cincinnati approximating in healthiness, the driest and most elevated situations, remote from the river.

Section 3. *Mineral Springs.*

The western country is abundantly supplied with *salines*, or salt springs. The richest and most copious are on the bank of Great Kenhawa, in the western part of Virginia. Along with the common salt, *muriate of soda*, there is a large portion of the *muriate of lime*, as I have found by examining the *bittern* or *mother water*, which seems to consist entirely of that salt.

are the *salines* at Big Bone, 22 miles south-west of the town, in the state of Kentucky. They are several in number, and their waters were formerly employed in the manufacture of salt; until the discovery of stronger *salines* on the Great Kenhawa, reduced the price of that article below what it could be afforded when manufactured at these *licks*. The waters at Big Bone hold in solution, besides common salt, the *muriate of lime*, *sulphate of soda* or *magnesia*, and a few other salts of less activity, but no iron. They afford a great quantity of *sulphurated hydrogen gas*, which is constantly escaping in bubbles. From their effects on the sulphates of copper and iron, they appear obviously to contain a portion of *gallic acid*, that is no doubt furnished by the vegetable matter through which the waters rise. The springs are situated near the termination of the back water of the Ohio, and consequently at a point where great quantities of twigs and leaves (most of which from the nature of the surrounding forest must be of oak) are brought down by the current, and deposited. The temperature of the springs is 57 degrees. Their taste and smell are sulphurous, and offensive to strangers; but the impression made by the gas is transient, and the taste of the common salt afterwards predominates. They do not increase the pulse, but their sensible effects on the alimentary system, kidneys and skin, are great. The action of the two former are very much increased; and the latter is frequently affected in a few days with a violent itching, and an eruption of pimples or pustules, which are now and then connected with large *boils*. These waters are, however, neither serviceable nor safe to persons whose constitutions have been long and generally debilitated; whose digestion is bad, from permanent weakness of the stomach; who are affected with head ach, and a general reduction in the energy of the nervous system; or who labour under that species of pulmonary consumption which will not bear depletion. The disorders to which they seem peculiarly adapted, are the torpor, obstruction or chronic inflammation produced by acute diseases in the lungs, liver, spleen, kidneys; in short, any of the viscera; and which have not continued so long that the constitution is exhausted. In these cases, experience has shown them to possess all the efficacy which could be expected in any mineral water. From a pint to a gallon, may be taken daily, accord-

ing to the strength of the patient, and its sensible effects on the system. The quantity drunk at first, should be small, especially by those of a reduced habit.

The valley in which these springs are situated, is of moderate width, and bounded by a waving and irregular rampart of elevated hills. The scenery is romantic, and not destitute of picturesque features; but the verdure in spring and summer is rather unvaried, and the enchantment of a distant perspective is wanting. These defects in the configuration of the vale are, however, amply compensated by the mighty relics which it entombs. It is now more than half a century since these first attracted the attention of European travellers; and so many have been borne off, that a few fragments only remain on the surface, to excite the associations and recollections which this consecrated spot is calculated to inspire. As no other place hitherto discovered in the Union has afforded such quantities of huge animal remains, and as the first ever transmitted to the philosophers of Europe, were collected here, the Big Bone valley deserves, among naturalists, a classical distinction. It is indeed well worthy a visit from those who can relish the sentiments and the speculations excited by contemplating the ruins of the largest animal species which have appeared on our globe. And if, according to Mr. Jefferson, the passage of the Potomac through the Blue Ridge, be a scene worth a voyage across the Atlantic—the tomb of the mammoths will certainly reward the traveller of taste and science, for a journey from Cincinnati.

An establishment for the preparation of *artificial mineral waters*, was made in the spring of the present year; and during the few weeks that it continued in operation, it attracted much attention. The proprietor has made arrangements for opening a greater number of fountains the ensuing summer; and will be able, hereafter, to supply the citizens of Cincinnati with as fine a variety of these salutary waters, as any of the large cities can afford.

On the Relation subsisting between the Time of the Day, and various Functions of the Human Body; and on the Manner in which the Pulsations of the Heart and Arteries are affected by Muscular exertion. By Robert Knox, M. D. Edinburgh.*

To the Editor of the Edinburgh Medical and Surgical Journal.

SIR,

I have ventured to submit to you for your approbation some observations and experiments on a subject, which, for some time, has occupied a considerable share of my attention. The matter itself will perhaps at first sight, appear to many rather curious, than interesting or useful. But it ought to be remembered that observations, in themselves apparently of little direct importance, have, in the progress of time, been found much to benefit science.

I may here briefly mention the circumstances which first induced me to investigate opinions, to the correctness of which so many had unlimitedly subscribed. Annoyed like others with the interminable disputes concerning the *stimulant* and *sedative* powers of foxglove, I resolved to make a few experiments on that celebrated drug. A variety of perplexing circumstances soon convinced me of the necessity there was, correctly to ascertain the various conditions of the healthy pulse, particularly as regarding muscular exertions, diet, &c. This knowledge, however, I found was not to be attained in a short time, nor without considerable labour. Contrary to my expectations, that which I deemed of minor importance, or merely preparatory to other researches, became a valuable subject of inquiry.

Whilst conducting the experiments about to be related, I have often almost despaired of reducing to general laws the endless variety which the functions of the animal economy present to every observer. But remarking, amidst this seemingly inextricable confusion, a certain degree of regularity, I was induced and encouraged to prosecute the inquiry, convinced that we ought never to disregard those signs of order which nature manifests, whether they regard animate or inanimate beings.

* From the Edinburgh Medical and Surgical Journal, for January and April, 1815.

It is almost needless for me to observe, that every precaution has been taken to avoid error. If, throughout the essay, this desirable object be attained, it is principally attributable to the assistance of my friend Dr. James Thomson, continued with unremitting zeal and friendship, during a course of experiments both tedious and delicate.*

Section I.

1st, When we recollect that it is during the course of the day that all those circumstances, which tend to accelerate the pulse, are generally combined and present, the proposition that the morning pulse of a person enjoying health is quicker than the evening one, must seem almost a paradox; at all events so hostile to what appears probable or plausible, that the clearest evidence of its truth must be brought forward before we could expect to gain a single proselyte.

In detailing the results of my observations and experiments on this subject, a certain degree of license is necessarily made use of, which, however, does not at all affect the conclusions I have drawn. In these experiments it is not proposed to submit the functions of the body to rigorous calculation. In physiology, as well as in medicine, a near approximation to the truth is the only rational end we can possibly propose. Numbers are used, both because they render our ideas more precise, and cause to be distinctly perceived the limits to which we should wish to extend these doctrines. The variation in different individuals must necessarily be immense;—for that the candid will make proper allowance.

Dr. Cullen, (whose name is not merely celebrated, but venerated in medical science,) talked of a natural acceleration of the pulse, which, according to him, happens twice a-day, and resembles, in a distant manner, a febrile paroxysm. Now, amidst many hundred experiments, performed under a great variety of circumstances, I could never perceive any such phe-

* The subject of the experiments is about 22 years of age, of a moderate height, and somewhat muscular; his constitution may be called irritable,—by which is meant only, that it is easily excited by stimulants of almost every kind. He has not laboured under any serious disposition for a great number of years, nor is he conscious of any hereditary or acquired tendency to disease in any organ.

nomenon. The time of the day at which the first spontaneous acceleration is supposed to happen, is noon. My own pulse never shewed any symptoms of such acceleration, but, on the contrary, always diminished in velocity. Thus,

Ex. 11, A. M. . . . . Pulse 72
12, noon, ... 71
1, P. M. 65
Half past 1, P. M. 64

The other paroxysm, according to the same author, occurs in the afternoon, and that, too, totally independent of any excitement by food, &c. This opinion is equally erroneous with the former.

Ex. 3, P. M. . . . . Pulse 68
4, ... 66
5, ... 64
6, ... 62

Ex. Half past 3, P. M. Pulse 67
Half past 4, P. M. 67
5, P M. 64
Half past 5, ... 63
6, P. M. 63
Half past 6, ... Pulse 62
7, P. M. 62
Half past 7, ... 60
8, P. M. 58

These experiments are in direct opposition to the statements of Cullen; yet, whoever carefully peruses that author's works, more anxious to discover truth, than, by partial views and misrepresentations, to detect contradictions, will be convinced that Cullen's notions are partly just, and partly erroneous;—that delicate and accurate observation is blended throughout with supposition, assertion, and hypothesis.

2d, This quickness of the arterial pulsation, observable in the morning, is at present very generally disbelieved; yet nothing can be more easy than to ascertain the fact experimentally. Perhaps the following instances, taken at random from a great number of others, may go far to settle the point. In the following table the pulse was reckoned in the sitting posture, (this is always to be understood, unless the contrary be expressed) before breakfast, and a short time after rising from bed; and, in the evening, after a light supper, and generally

some spirituous liquor, taken, however, in small quantity, and much diluted. The power of alcohol in raising the pulse is well known. The period is the summer time.

TABLE.

About 9, A. M.		About 12, P. M.	
68	68	63	63
65	74	70	70
68	70	62	66
68	69	61	62
67	65	59	63
62	70	63	72
70	71	62	72
70	68	61	72
64	76	66	62
The average result of these is 68.5.		The average is 64.38.	

To render the result of this table the more striking, it is necessary for me to point out a few circumstances, to which considerable attention ought to be paid. In the morning, the pulse was reckoned immediately almost on rising from bed, and always before food of any kind was taken. Every circumstance, therefore, conspired to reduce the pulse. On the other hand, the evening pulse was reckoned after the many exertions undergone during a long day,—after exercise of mind and body,—after food and drink; the pulse is, notwithstanding, considerably less frequent than in the morning, when every thing favourable to the rapid state of the circulation was carefully guarded against. But the pulse is not only in general quicker in the morning than in the evening; it is also more excitable; i. e. the same quantity of food or drink, the same degree of exercise, shall be found to exalt the pulse more in the morning than at any other period of the day or night; and the capability of being excited may, generally speaking, be said to diminish from a very early hour until the same hour next morning. The *data* on which this assertion rests are pretty numerous, though not so complete as I could have wished them to be. To accomplish this, would have required a complete change of my mode of life, which I found at the time impracticable.

TABLE

Showing the different states of the pulse, as reckoned at three different periods of the day, viz. after breakfast, dinner, and supper. The experiment was made during summer.

After breakfast, always before 10, A. M.	After dinner, before 5, P. M.	Evening, between 10 and 12, P. M. generally near 12.
Pulse 66	Pulse 68	Pulse 63
68	71	70
69	73	62
66	69	61
69	71	59
69	74	62
70	76	65
64	66	63
80	80	68
73	80	70
75	76	76
80	76	68
74	84	60
74	72	63
78	72	59
75	72	62
76	80	66
73	76	62
Average 72.	Average 74.22, &c.	Average 64.388, &c.

The conclusions to be drawn from this table are obvious. To render them still more so, I may observe, that the breakfast is generally a moderate one, consisting of coffee, bread, and eggs; the dinner always of animal food principally, and a small quantity of vegetables; to which was often added a little spirits or porter; and, notwithstanding the vast difference between the stimulating powers of these two meals, the morning pulse is inferior to the one after dinner by only two beats; the difference would have been ten or fifteen, had the case been reversed, at least I am induced to think so from some experiments which I afterwards instituted directly to ascertain the point. In the evening the pulse was reckoned after supper, light, indeed, but certainly equal to the breakfast in stimulant power, and in some measure more so, because spirituous liquors

very generally supplied the place of coffee. Notwithstanding this, the evening pulse is found to be, on an average, nearly eight beats lower than the morning one; a difference by no means inconsiderable, and sufficiently warranting the conclusions I have drawn from it.

The following table was drawn up, in order to ascertain the effects which moderate exercise in the morning would produce on the pulse, reckoned, however, in such a manner as not to be immediately affected by it.

TABLE.

A walk of three miles before breakfast. Pulse after breakfast.	Pulse after dinner, as usual.	Pulse after supper, as usual.
74	76	62
81	78	62
80	75	62
83	78	64
80	75	66
78	74	64
Average 79.33.	Average 76.	Average 63.3, &c.

3. My experiments have not yet enabled me to ascertain, with precision, the hour when the pulse begins not only to be actually more rapid, but also to acquire a greater capability for action, manifested by the exhibition of any stimulant. This, with myself, perhaps takes place about 3 P. M. (A. M.?); but there is every reason to believe that the time varies with the individual, the season, climate; and perhaps, though this for many reasons is improbable, with the mode of life.

4. This increased capability for action, occurring regularly in the morning, is even of greater importance than the *actual state* of the circulation; the former may be made the subject of very delicate experiments; the latter we know to be exposed to a thousand variations, from causes which have been in part developed. While experimenting on this subject, there occurred to me a case, altogether of so interesting a nature, that I cannot refrain from giving it in detail. It affords a remarkable proof of the truth of the doctrines brought forward in this essay; at the same time, independent of this consideration, from the rarity of its occurrence, it appears to be worthy of record.

M. C. aged 4.—The account we received from the parents of this child was, that she continued in good health until about six months after birth, when a blueness of the surface was remarked, particularly on any exertion, and accompanied with perpetual difficulty of breathing. In this state she continued to grow, and became remarkably tall of her age. She was observed, however, to get daily worse; that is, the paroxysms of threatened suffocation became more frequent, during which the whole surface of her body appeared almost black. A strong beating was constantly to be felt in the region of the heart, and she was sometimes convulsed; muscular debility great. At her death she measured three feet four inches. The body continued warm for five hours after death.

Dissection.

1. *External appearances.* The countenance, feet, and body, were not all discoloured; the arms and fingers retained their usual dark colour.

2. *Thorax.* The lungs seemed sound, though dark-coloured; heart perhaps larger than usual; *foramen ovale* pervious, and pretty large. The *aorta* arose from both ventricles in such a manner, that the ventricles communicated with each other, and with the cavity of the vessel, which was much enlarged; its *vasa vasorum* distended with red blood. From the right ventricle there arose a pulmonary artery, very small in its diameter, (perhaps the size of a small goose quill) and feeble in its coats; it possessed all the characters of the artery, such as its valves and division into two branches. Not the smallest vestige of a *ductus arteriosus;* it seemed never to have existed. The passage from the left ventricle into the artery, common to both, was more direct than that from the right. Every where the arteries were full of dark blood, not coagulated.

3. The abdominal viscera were of a very dark colour. The head was not examined.

Before leaving the house, the father of the child related to us a circumstance to which we all paid particular attention. The child, he informed us, had always been very fretful and peevish, (perhaps from indulgence,) and apt to have frightful paroxysms when spoken to harshly; but these happened much more fre-

quently in the morning; indeed he observed that she was always ill in the early part of the day; so much so, that the smallest exertion, an angry word, or even a cup of tea, would instantly bring on a paroxysm, each time threatening destruction. This tendency to these fits decreased from morning, till about 5, P. M. from which time she generally continued well till bedtime. The father detailed this with great minuteness, and seemed to wish for an explanation.

It will be easy to anticipate to what cause I would ascribe this increase of disorder in the circulation, during the forenoon. So disproportionate was the pulmonary artery to the aorta, it was with difficulty that life could be carried on; but, in the morning, when the susceptibility of the arterial system was greater, the inequality must also have been increased to such a degree as almost to have destroyed life. I may also remark that she died about 9, A. M.

5. To be convinced that an opinion, very different from that now brought forward, is the one more generally received, we have only to turn to the writings of a few celebrated physiologists. Thus, for example, in the "Physiologie Positive" of Fodéré, a work of merit, we find the following remarkable passage: "Relativement à la difference du jour et de la nuit, on remarque que le pouls de l'homme adulte bat de 60 à 65 fois par minute, au commencement du jour, et qu'il va continuellement en augmentant jusqu'à battre 80 fois dans le même temps, chez les plus excitables, sur la fin de la journée; dans la nuit, les pulsations diminuent de nouveau, jusqu'au matin, où elles se trouvent revenues insensiblement au nombre de 60 à 65."* In order to have an approximation to the truth, we have only to reverse the above statement. If we regard as accidental circumstances the accelerations of the pulse, occasioned at various times by our diet, and that, too, according to the caprice of the individual, the pulse shall be found gradually to diminish in velocity from an early hour until midnight, and generally later. This difference I have found to be great in winter, but less, though still existing, in summer; as the above experiments, performed during that period, sufficiently prove; and from this I am inclined to believe, that heat has no inconsiderable share in

* Essai de Physiologie Positive, Tom. I. p. 190.

the production of the phenomenon, though totally inadequate solely to produce it. This gradual excitation in the number of the pulsations Fodéré conceives to be owing to the combined effects of exercise, of the action of the internal and external senses, of light, heat, purer air, &c. Violent exercise towards evening will certainly produce a considerable excitation of the pulse, but less than what takes place in the morning, in consequence of the same degree of exercise; neither will any degree of heat, nor quantity of food, raise the pulse in the evening to the height at which it is in the morning, almost without any such excitants, provided they be not used in an immoderate degree.* Thus, after fasting till 8 P. M. I found my pulse to be 58; at 9 P. M. after eating a moderate dinner, pulse 58.

The common mode of experimenting with unequal quantities of food, taken at various hours of the day and night, was evidently insufficient to establish the principle in its full extent. I endeavoured, accordingly, to submit to a particular regimen, and examine the state of the pulse under the influence of a diet always similar at every hour of the day. This decisive experiment could not be pushed any length; so difficult a matter did I find it to break through, at once, those habits which a great number of years had firmly established.

6. "All these things (continues Fodéré) singularly facilitate the return of the venous blood towards the heart; and this is one of the causes of the evening paroxysm which takes place in all fevers." But, having denied that any such gradual increase of the pulse exists, we need scarcely stop to say, that this cannot be one of the causes of the evening paroxysms in fever.

This opinion appears to be borrowed from the celebrated Cullen. That author, however, increased the facility of explanation, by describing two exacerbations or augmentations of the pulse; one about mid-day, the other towards evening. This explains, in his opinion, the occurrence of the double paroxysm in hectic fever.† The whole is a pure *hypothesis*, which seems partly to have arisen from supposing that the pulse was governed by the same laws in health and disease. So far as my observa-

* In experimenting on this point, care must be taken that the acceleration of the pulse, occasioned by indigestion, be not confounded with the natural healthy pulse, produced by the simple stimulation of the food.

† First Lines of the Practice of Physic, Vol. I. c. 862.

tions go, the order of nature in disease is entirely reversed, and the observations of Cullen, Fodéré, and others, are applicable only to the unhealthy. That this acceleration of the pulse (which is really an aberration from the regular laws of nature) actually happens in fever, the testimony of Cullen, generally so accurate in the observance of disease, will sufficiently establish; and that this universally takes place in phthisis, we have, unfortunately, too many opportunities to verify.* It was from the sinking of the pulse towards evening that I ventured, independent of other circumstances, to prognosticate favourably in the case of a child labouring under typhus fever. It was this which induced me to hope that some of the functions had begun to resume their natural order, and that recovery was a probable event. Nor was I deceived; by proper attention the patient from that day rapidly amended.

7. The physiologists who invented the various diurnal accelerations of the pulse, one, two, or more, just as suited their fancy or necessity, will perhaps find little difficulty in explaining the gradual diminution of the pulse, should the phenomenon appear to them to be correctly stated. With me, I confess, the cause is yet excessively obscure, because I have not found it connected with any circumstance, to the influence of which I might ascribe it. Experiment showed me that no previous exhaustion from labour, excess in food, drink, &c. rendered the diurnal diminution of the pulsations more evident than usual; the want of food, perhaps, hastens and increases it, but certainly does not prevent or retard it. Neither is sleep the cause of the restoration of the susceptibilities and velocity of the morning pulse, since the negation of that does not at all destroy the *excitability*† of the sanguiferous system, as manifested by the application of the accustomed stimulants.

August 30th, 1813, the day being moderately warm, I walked, between 1 and 11 P. M. a distance of nearly 40 miles. Not having much appetite, retired to rest about 1 A. M. after drinking a little coffee, but slept none, perhaps owing to over-fatigue. Next morning (31st) about 7, my pulse was 80 and rather feeble; after breakfast, before which I took a small glassfull of

* Beddoes' Essay on Consumption, p. 252.

† I use this word merely to avoid circumlocution.

spirits, my pulse rose to 104. I was not feverish, and performed a journey that day of 27 miles, at a tolerable pace.

To what, then, are we to attribute this daily diminution of velocity in the functions of the sanguiferous system? Its existence as a law of the sanguiferous system, has been demonstrated experimentally; and I shall endeavour to show, that a similar revolution daily takes place in several other functions of the human frame. To this conclusion Dr. Cullen arrived, merely from observing the daily returns of sleep and watching, of appetites and excretions, and the changes which regularly occur in the state of the pulse. Of these changes he had, however, no clear ideas. When he proceeds to combine this diurnal revolution with the phenomena of fever, he unquestionably offers a conjecture, extremely probable, ingenious, and perhaps original; but unfortunately, there results from this fine idea nothing but conjecture and hypothesis, attributable principally to an incorrectness in the observance of the phenomena.

8. It required few experiments to convince me, that animal food raised the pulse much more than vegetable; the excitation of the pulse by wine is still greater, and that from spirituous liquors greatest of all. By these circumstances, but more especially by diet, the regularity in the diurnal revolution in the pulse, is, as might have been anticipated, much disturbed. But it was impossible to perform these experiments without remarking, that something similar happened to various other functions. Thus, beyond all doubt, our perceptions in the early part of the day are clearer, our minds more acute, our whole intelligence more active. The functions of the stomach seem also much stronger at this time than towards the evening. Feverish, restless nights, are the invariable attendants on late meals, which injure in the *ratio* of their quantity.

I have repeatedly remarked, that digestion went on more easily in the morning than in the evening. Three or four times have I been induced (sometimes compelled), whilst following some favourite sport in the country, to defer the taking food until evening; a greater or less degree of fever and restlessness, in proportion to the quantity of food taken, has uniformly followed such indulgence.

It was long with me a problem difficult of solution, why digestion should go on laboriously during the evening, when the

actions of the muscular system were almost entirely suspended; more especially when I recollected, that the opinions of most, perhaps of all physiologists, led us to conclude, that rest greatly favoured the digestion of our food. The objection, that during sleep, in which state the repose of the body is complete, digestion, nevertheless, is generally ill performed, seemed at first insurmountable; and it is not a little remarkable, that those physiologists who have so repeatedly stated the fact, have as constantly failed to note the objection. On observing that practical men expressly stated the necessity of rest for the right performance of the function of digestion, and experiencing daily the truth of the observation, I was convinced that the above objection was rather inexplicable than hostile to the opinions of physiologists, which I then, and still do consider as strictly correct. But this phenomenon is no longer difficult of explanation, if a daily revolution in the functions of the stomach be demonstrated by experiments, or even rendered probable by analogy.

On this subject, the opinion of those, whose profession it is to train men to the performance of great muscular feats, when they speak the truth, is of much more consequence than that of any medical man. Experience has taught them that the evening is not a proper time for the digestion of the food; and accordingly we never find any substantial meal taken by their pupils after 5 P. M.; indeed they lay it down as a rule, that on going to bed, the stomach should have as little to do as possible. Thus it is recommended* to sup about 9 o'clock on a chicken, or some food that is nourishing, not gross. In another place,† you must retire early to rest, on a supper of runnet-milk, or milk-pottage. Again‡, two meals a-day, viz. at 8 A. M. and 5 P. M. But these hours are rather later than the ones laid down by Jackson, who says,§ "they breakfast upon meat about 8 o'clock, and dine at 2. Suppers are not recommended, but they may take a biscuit and a little cold water about 8 o'clock (I never heard of a more moderate supper) two hours before they go to bed."

* Sinclair's Code of Health, Vol. II. p. 163.
† Ibid p. 112. ‡ Ibid p. 104. § Ibid p. 94.

The object kept in view during the training, is to enable the human frame to acquire the utmost degree of vigour consistent with health. To accomplish this, they employ the organs at the time when they ought to be employed, that is, during the early part of the day. "The exercise is always begun early in the morning, in summer at five; in winter at half-past six, or as soon as it is light. We prefer rising early in the morning, indeed it is indispensable."

Strictly speaking, this increase in the functions of the body, may be more properly called an augmentation and diurnal revolution in the functions of the nervous system. But this is too indefinite a term; no two individuals attaching precisely the same meaning to it; and we shall therefore consider the above facts, brought forward by Mr. Jackson, as proofs of an increase in the powers of the muscular system, without offering any conjecture on what that peculiarly depends; whether it be connected with increased energy of the brain, or be totally independent of it.

I shall close this part with a single additional observation. It is this: The regular decrease in the powers of the stomach is not dependent on any previous exertion of that organ, for I have found that a dinner taken at a late hour, with or without previous exhaustion, was always digested painfully and laboriously, with feverish nights, distressing dreams, and, instead of refreshment, further exhaustion. This arises not from the food stimulating at that time the system more powerfully than in the morning. If we may judge from the pulse, it stimulates the body much less at midnight than at nine in the morning; but it arises from this, that the powers of the stomach are more languid; it does not digest the food taken into it; and should a feverish night follow, it is neither wonderful nor inexplicable. Hence we see the propriety of no function being much employed during the evening; not because it will greatly excite the pulse, and so produce fever (ridiculous idea! the excitation of the pulse does not produce or constitute fever); on the contrary, the stimulation is actually less, it is almost as nothing, so far as regards the pulse; but the phenomenon is occasioned by this, that all the organs are less powerful, less capable of exertion; in short less able to perform their functions, or undergo fatigue. A remark made by Cullen also illustrates in

some degree the doctrine I have brought forward. "It is indeed to be observed, that in almost every person the taking of food occasions some degree of fever; but I am persuaded this would not appear so considerable in a hectic, were it not that an exacerbation of fever is present from another cause; *and accordingly the taking of food in the morning has hardly any sensible effect.*" Here we see what so seldom happens, all the facts throwing light on the doctrine, and it on them; for although the morning be the time when the action of food over the pulse is greatest, yet is there no febrile state excited. On the contrary, in the evening, as Cullen has remarked, a febrile paroxysm occurs in hectic, independent of food, aggravated perhaps by its presence, but whose real cause has totally escaped him.

9. Nor does this law seem confined to the functions of the brain, stomach, muscular, and arterial systems,—it extends, if I mistake not, to that of the lungs. Dr. Prout found, "that the quantity of carbonic acid gas, formed during respiration, is not uniformly the same during the twenty-four hours, but is always greater at one and the same part of the day than at any other, that is to say, its *maximum* occurs between 10, A. M. and 2, P. M., or generally between 11, A. M. and 1, P. M.; and its *minimum* commences about half past 8, P. M., and continues nearly uniform till about half past 3, A. M."* The same gentleman observes, that the quantity of carbonic acid given off during respiration, bears no proportion to the numerical state of the pulse; in fact, he imagines that most carbonic acid is given out when the pulse is least frequent. My own experiments undoubtedly disprove this idea. The greatest quantity of acid, according to Dr. Prout, was given off during the forenoon, when the pulse is, in general, higher, and always more easily excited by any exertion; we may almost say, that the capabilities of the arterial system are at that time greater; and the importance of this remark, as it regards *secretions*, must be obvious. Besides, from what I can judge of the tables given by Dr. Prout, they refer principally to the afternoon and evening, unless some of the tables be wrong marked. Notwithstanding this, I am much inclined to agree with him in this, that the quantity of carbonic acid given off during respiration is not

* Annals of Philosophy, Vol. II. p. 330.

particularly connected with, at all events, not dependent on, the state of the circulation. His experiments on the state of the respiratory organs after exercise—after the taking of spirituous liquors—during a mercurial course;*—in short, after every thing which could excite the circulation, show this in a decided manner. These experiments, however, require repetition. Many of them are too scanty to enable us to draw any certain conclusion from them, whilst others are contrary to all analogy.

The opinions contained in the excellent essay of Dr. Prout do not seem to invalidate the conclusions which I have ventured to draw from my experiments: they amount to this—that all the functions, or at least many of them, are more vigorous in the morning than in the evening; that their capability for action is certainly greater; and that this increase in the functions commences at a much earlier hour than is generally imagined.

Were it lawful for me to speculate, in this experimental age, I would venture to support an opinion, at present, I allow, something antiquated, and very *unfashionable*, that early rising may be conductive to long life, as it most certainly is to the perfect enjoyment of all our faculties. It was from repeated violations of all these dietetic maxims that I first perceived their importance; perhaps by a similar experience alone can others be convinced of their value.

Before concluding this section, it is my duty to observe, that, on mentioning the results of some of these experiments to a medical friend, he assured me that experiments, performed by him about ten years ago, led to conclusions which were, in his opinion, extremely similar to mine. This circumstance, he observed, was very satisfactory to him, as my experiments had been performed, and my conclusions drawn, without any communication of ideas: it will be equally so to me, if I find the results exactly to correspond;—results of experiments performed by individuals so opposite in habits, temperament, and opinions.

Section II.

In this section, we propose considering the effects of muscular motion on the pulsations of the heart and arteries. In what

* Dissertatio de Copia Acidi Carbonici, &c. Andrea Fyfe auctore, Edin. 1814.

manner these pulsations are augmented in number, vigour, fulness, &c. by exercise, or, to speak more generally and correctly, by muscular motion, it is perhaps impossible, in the present state of our knowledge, to say. It seems however probable, that farther research may shortly lead to notions more precise than the ones we at present possess. Our concern is with the fact itself; *viz.* that, by muscular action, the pulsations of the heart and arteries are augmented in power, velocity, &c. This fact, apparently so unproductive, and, by reason of its perpetual occurrence, so little apt to excite attention, shall yet, on examination, be found to throw some light on the physiology of the human body, and may perhaps assist in exonerating it from a charge so lavishly and inconsiderately bestowed,—that it is a science destitute of fixed principles; or at least, that a knowledge of the laws by which the animal economy is regulated, is, in a great measure, placed beyond the sphere of human intellect.

At all times it must have been observed, that muscular exertion, almost of any kind, but more especially violent exercise, increased greatly the powers of the heart and arterial system; but that this extended even to the slightest muscular motion, such, for example, as is made use of during a change of posture, does not appear to have been suspected, or if so, its importance has been greatly overlooked. We may reduce the section to the following heads:

1*mo*, The most powerful stimulant which can be applied, in order to increase the action of the heart, is exercise. Walking at the rate of four miles an hour, requires at least a pulse equal to 132 *per* minute; and the time of the day, and the continuance of the exertion, less affect the rate of pulsation than one would *a priori* imagine. When I say, that walking at such a rate requires a certain increase in the arterial pulsations, I do not mean to assert, that an equal increase must necessarily occur in every individual. These numbers are added only to render the subject more definite; in short, as a single example,—as a proof that the increase is great, even in the strong and healthy. We shall immediately see how very differently the debilitated are affected. This high excitement is not followed by proportional exhaustion, in so far as regards the arterial system; a fact singular enough, since it is at variance with cer-

tain laws of the economy, supposed to rest on a secure foundation. Other organs certainly follow a different mode, and exhibit, after any increase in their functions, signs of exhaustion or weakened energy. Such a law seems to hold with regard to the nervous system, in particular with the digestive organs and the respiratory.*

2*do*, No stimulant which I have hitherto tried, has excited the pulse so much even as moderate exercise.

3*tio*, Various observations have rendered it probable, that the increase in the number of the arterial pulsations accompanying muscular motion, is greatly influenced by the debility or weakness of the individual. Were it allowable to apply the rigorous language of calculation to a science which cannot be called *exact*, we would say that such increase is in the direct *ratio* of that debility. Hence, in fever, the slightest change of posture shall often produce an incredible velocity of pulse. Persons who have suffered much from loss of blood, or by chronic complaints, cannot bear the erect posture for any length of time; and hence, in the debilitated, who, it is well known, are very subject to faintings, the slightest muscular motion by inducing or necessitating a rapid motion of the blood (in them too rapid,) shall give rise to that distressing accident.

As exercise increases, so other stimulants diminish the frequency of the pulse in the debilitated, at least generally. But as there may be various kinds of *debility*, in each of which the pulse may be differently affected by exercise, and as this increase of the pulse, when it does take place, is often accompanied with irregularity, a very extensive series of experiments is required, before we can implicitly agree with the above rule. On this latter principle, even in its present state, we may explain, I think, satisfactorily, many of the supposed stimulant effects of foxglove, which drug debilitates, directly and greatly, most *systems* of the animal economy.

4*to*, The time of the day has a very considerable effect on the augmentation of the arterial pulsations by moderate exercise. As this relation has already been considered at some length, I shall here confine myself to the statement of a few general results. During the morning, the mere change of

* Annals of Philosophy for November 1813, p. 328.

posture from the horizontal to the erect, shall increase the pulse by about 15 or 20 beats. At mid-day, this increase shall be 10; and, in the evening, 4 or 6. The effects produced by the sitting posture, assumed after the horizontal, are not half so considerable as those occasioned by the erect posture. The above is the manner in which the arterial pulsations are affected by posture, at different periods of the day; and though the results here stated may be greatly magnified in some, and equally diminished in others, it may, I think, be laid down as a general rule, that similar laws constantly regulate the healthy pulse.

From the above observation, we readily perceive, of how little consequence the details of physicians are, regarding the diseased pulse. If the slightest change of posture can in an instant excite the pulse by 50 or 60 beats, how easily may the medical man deceive himself and others! how often, without a previous knowledge of these facts, may drugs seem to benefit the sick, when they are inert, or actually pernicious.

5to, The increase of the pulsations occasioned by change of posture, may shortly prove a valuable *asthenometer*. There are others, but they do not seem so certainly to indicate debility as the above. Some of them, indeed, are more calculated to detect disease than simple debility. These *asthenometers* are* the hot-bath, the cold-bath, or cold air, also the non-excitation of the pulse by stimulants, supposed to happen in those habituated to spirituous liquors. Some may allege, and perhaps with justice, that this shall be found to indicate rather a state of disease than debility. This condition of the arterial, or perhaps nervous system, which renders the pulse non-excitable by stimulants, is supposed to arise from other causes besides the abuse of spirituous liquors. "Une† observation très remarquable que j'ai eu occasion de faire, c'est que, lorsque la sensibilité a été émoussée par une affection chronique, les opiacées finissent par n'avoir plus de prise sur l'economié animale." I have seen one case which favoured somewhat the above opinion,—the case of a young man, who, without doubt, laboured

* Beddoes's Hygeia.

† Nouveaux Elémens de Therapeut. et de Mat. Med. par Alibert, Tom. II. 506.

under hereditary predisposition to consumption. His pulse, on one occasion, I found to be not at all affected by a very great quantity of spirituous liquors. The opinion remains to be proved or refuted by additional observation. Indeed, as it is customary with those labouring under chronic complaints to resort to the use of narcotics, (this practice had not been adopted in the case just mentioned), it is not to be wondered at that this class of drugs should at last cease to produce their wonted effects.

Somewhat connected with this subject is the detection of commencing disease in the lungs, or pulmonic debility. This, according to Beddoes,* is indicated by a continued high pulse. "When consumption is advancing, it will be more frequent than natural, and, in general, much more frequent towards the close of day." The whole subject is novel, and deserves attention.

As my only wish in prosecuting these experiments has been to correct a few notions regarding the physiology of the human body, and to advance that estimable science, I shall feel gratified with an examination of my experiments, whether that lead to a refutation or to a confirmation of the opinions maintained throughout this essay.

Observations respecting the Natural Production of Saltpetre on the Walls of subterraneous and other Buildings. By JOHN KIDD, M. D. Professor of Chemistry at Oxford. Communicated by WILLIAM HYDE WOLLASTON, M.D. Sec. R.S.†

[From the Philosophical Magazine and Journal, for December, 1814.]

ALTHOUGH the following observations afford no positive evidence of the source of that saline efflorescence which is so frequently seen on the walls of subterraneous and other buildings, and which, as consisting principally if not entirely of common nitre, long since gave rise to the name‡ by which that salt is most commonly known; yet as tending to throw some

* Essay on Consumption, p. 252.

† From the Philosophical Transactions for 1814, part ii.

‡ Saltpetre (Sal Petræ)

light on a very obscure part of natural history, they will not, perhaps, be unacceptable to this honourable and learned society.

There can be no doubt that the production of saltpetre or nitre, in the situations above alluded to, had been observed long before there existed any general inducement to collect it from those sources; but after the invention and subsequent extensive employment of gunpowder, it became an object not only to search out every natural source of the principal ingredient of that important compound, but also to investigate the circumstances of its production; for the purpose either of accelerating the natural process, or of imitating it by artificial means.

The usual and almost exclusive occurrence of saltpetre on walls constructed of limestone, and in situations exposed to animal and vegetable effluvia, in all probability led to the empirical practice of heaping together the mortar and refuse of old buildings with putrescent animal and vegetable matter; from a mixture of which kind, after exposure for a sufficient length of time to the action of the air, a quantity of nitre may usually be obtained by lixiviation: but it would be a question of mere curiosity, on this occasion at least, to investigate the origin of the practice. The intention of the present paper is to state the result of a series of observations, made during the last year, on the connexion that exists between the natural production of nitre and the state of the atmosphere. In detailing these observations, it will be convenient to give previously a description of the laboratory of the Ashmole Museum, in which building they were principally made: nor shall I be afraid of being thought too minute in this description, or in any other part of the following detail, by those at least who know the precision that is requisite in every induction, which like the present rests on phenomena of an obscure and equivocal nature.

The Ashmole Museum, which was built by Sir C. Wren in the reign of Charles the Second, is an insulated building, constructed entirely of calcareous freestone, and consisting of three stories. The lowermost of these stories was originally designed for, and has constantly been used as, a chemical laboratory.

The pavement of the laboratory, on its eastern, northern, and western sides, is about nine feet below the level of the street in which the Museum stands; on its southern side it is on the same level with an area, about ten feet in breadth, which in part occupies the site of the ditch of the old town, and insulates a quadrangular projecting part of the whole building of the Museum. The laboratory itself is a single room sixty feet in length from east to west, and twenty-five in breadth; having an arched stone cieling, the centre of which is seventeen feet above the level of the pavement. The walls of this room, which are nearly three feet in thickness, are constructed of squared calcareous freestone, which I have reason to believe was dug from a quarry near Burford, and is technically called Windrush stone, from the river of the same name. There are four windows in the upper part of the north side of the laboratory, formed in the curve of the arched cieling; the dimensions of each of which are five feet by four and a half.

There is no window either on the eastern or western side of the laboratory.

On the south side there are two windows, one at each extremity, looking into the area above described; and these windows are placed at the usual distance from the ground, that is, about three feet: and all that part of the south side intermediate to these two windows separates the laboratory from the quadrangular projecting part of the whole building of the Museum already mentioned.

The saline efflorescence takes place most copiously on the north wall, and it occurs on various parts of it from nearly the level of the pavement to within three or four feet of the centre of the arched cieling. It takes place also, though not so abundantly, on the east and west walls; and also at the eastern and western extremity of the south wall; but it is worth noticing, that I have never seen it on that part of the south wall which is common to the laboratory and the attached projecting building of the Museum. It is true that there are chimneys in this wall connected with fires that are lighted daily; but this circumstance does not seem sufficient to account for the absence of the nitre, because its formation takes place in another part of the laboratory equally near a chimney, and in which, from

being inclosed, the temperature of the air is always considera-by hig er.

It is also worth noticing, that between the highest and lowest points of its appearance in every part of the building there are intercepted spaces entirely and always free from the least deposition.

I may here mention that the occasional formation of nitre is observable in many other buildings and parts of Oxford, besides the laboratory of the Ashmole Museum; as on the wall, called Long Wall, which bounds the park of Magdalene College to the west—on the exterior surface of the south wall of the Theatre—on the exterior surface of the three walls of the quadrangular projecting part of the Ashmole Museum—very abundantly on the inclined base of the windows of the Examination school, looking to the north—and also very abundantly on the west side of the wall, which separates the square of the schools from the arched way leading from thence to the Theatre and Convocation House.

It has been observed repeatedly, that the presence of lime is necessary to the natural production of saltpetre; and in all the foregoing instances the stone on which the saline efflorescence takes place is the common limestone of Oxfordshire. I have only once observed its formation on the surface of a brick wall: but in that instance the substance of those bricks on which the nitre appeared had crumbled away to some depth; and if this destruction of their texture be owing to the presence of an unusual proportion of lime in the clay of which they are made, (a supposition not improbable, since many parts of the stratum of clay from which the bricks in this neighbourhood are made do contain an unusual proportion of lime,) the reason of the exception in the case of this brick wall will correspond with the truth of the general observation above stated.

The following circumstance is particularly deserving of notice. A part of the north wall of the laboratory, on which saltpetre usually effloresced, having been covered with wainscot some months since, and the wainscot having been painted with common white paint, I was surprised after a time in observing an efflorescence on particular parts of the paint, similar to what might have been expected on the wall itself. Where this

efflorescence had taken place the paint was loosened from the wainscot, and might be readily peeled off in small flakes. The saline particles of which this efflorescence consisted I at first supposed to be nitrate of lead; but upon examination in various ways no trace of lead could be found in them, and they exhibited the principal characters of common nitre: they deflagrated, for instance, with charcoal, leaving a deliquescent alkaline residuum. Many weeks have elapsed since that saline efflorescence was brushed off, but I have not yet observed any renewal of it.

Though the production of saltpetre had been pointed out to me in the laboratory of the Ashmole Museum as long since as the year 1802, I was prevented by many circumstances from observing with any degree of regularity or precision the phenomena of this natural process previously to the commencement of last year; about which time having carefully brushed away the whole of the saline efflorescence from a part of the north wall situated below the level of the street, and very imperfectly exposed to the light, I was surprised by the fact of its quick re-appearance. It was brushed away at the end of January; but within three days it had again effloresced in sufficient quantity to present that appearance of hoar frost, or down, or mould, which is very characteristic of the manner in which naturally formed saltpetre is often accumulated; and which a person, utterly incapable of judging of the real nature of the substance, described at the time by the term "damp."

I was still more surprised, however, in observing after a few days, that the quantity of the saltpetre was apparently very much diminished; and that at the end of eight or ten days there was scarcely any appearance of it remaining: though there was no reason to suppose a particle had either accidentally fallen to the ground or been intentionally removed.

The same part of the wall was again brushed perfectly clean, and I continued to make daily observations in expectation of a renewal of the process; but no new collection was perceptible, excepting in the form of a very few detached and minute capillary crystals, till the 16th of March; on which day, having been absent during the whole of the 14th and 15th, I found a more abundant accumulation than in the preceding instances.

It was an obvious supposition that the reproduction of the

nitre was connected with some change in the state of the atmosphere: and it is to be remarked, that its first-mentioned appearance took place in frosty weather, and that its re-appearance about the 16th of March had been preceded by a frost of a few days: whereas during the intervals in which it disappeared and was not again produced, the weather had been mild. The wall was again brushed quite clean on the 16th of March; between which day and the 4th of April a considerable quantity had again collected on the same part; the process having been more rapid during the last four or five days, which were cold.

On April the 12th the front of this part of the wall was renewed by scraping, for the purpose of observing what would be the effect of a fresh surface, and before the 25th of April nitre had formed on many parts of this new surface; but having first increased and then continued stationary for some days, it began to diminish about the beginning of May, the state of the air having been very moist during the two or three preceding days.

About the middle of May 1813, I selected several distinct parts on which the spontaneous formation of nitre usually takes place, some within and some without the building of the Museum, and began to make daily observations on the phenomena of that process, which I noted down at the time: but as a register of this kind would be unnecessarily tedious in its recital, I shall beg leave to give the following general results of those observations; requesting it may be kept in mind, that I do not presume to lay a greater stress on them than is proportional to the short period of time and the circumscribed space in which they were made.

It appears then from the observations I have hitherto been able to make, that the spontaneous formation of saltpetre is, generally speaking, much more extensive and rapid in winter than in summer, whether it take place on the interior or exterior of a building: thus during the period of the cold weather in January 1814, it became visible not only on parts of the walls where I had never before observed it, but even on the pavement of the laboratory. The part of the pavement on which it appeared is adjacent to the north wall; but as the greater part of the pavement is covered by a flooring of wood, it is impossible to say whether or not it took place on other parts also. The

stone forming the pavement is the same kind of limestone as that of which the walls are built.

Again, whereas in summer its reproduction is most rapid and extensive in proportion to the degree of light present, the reverse of this (though not universally) takes place in winter. Wherever the saline efflorescence in question occurs, the surface of the stone becomes permanently discoloured, as if from the effect of damp; but this discoloration is merely superficial. If these discoloured parts be whitewashed, the process still goes on; and the whitewash is gradually detached in flakes: but it is difficult to ascertain whether the nitre is formed on the whitewash, or on the wall which it covers; though probably the latter.

When the spontaneous formation of nitre takes place slowly and in a sheltered situation, it is at first visible in the form of minute prismatic crystals, which usually project from the surface of the wall nearly at right angles; but sometimes they are scattered in different directions, lying upon its surface so lightly as scarcely to appear in contact with it. In general, however, the saline efflorescence makes its appearance in extremely minute capillary crystals, either accumulated in groups, which resemble recently fallen flakes of snow, or investing the wall like a fine down.

During the severely cold weather of January 1814, it appeared in some places in the form of minute dense grains closely aggregated; while in others it still continued to wear the appearance of down or wool: and the local circumstances most obviously connected with this difference in the manner of crystallization, were the presence of a greater degree of light, where the granular deposition took place, and a less degree of shelter from the influence of cold air.

In some instances the production of the saltpetre is accompanied with a disintegration of the substance of the stone on which it is formed; but this circumstance is only observable on stones of a loose texture.

The shortest interval I have observed between the time of its having been brushed away and its re-appearance, is four hours: but it was then in full efflorescence, and would probably have been visible much earlier. The observation was made

on November the 17th, about midnight: there had been snow in the middle of the day, and the night was frosty.

The spontaneous formation of nitre takes place indifferently on the surface of the stones composing a wall, and of the mortar by which those stones are cemented; and near the close of the late frost, I observed it for the first time on the surface of a partition consisting entirely of laths plastered over with the mortar or stucco commonly used for that purpose.

It accumulates in greater quantity on some parts of a given surface than on others; and this difference in the degree of its accumulation, is probably connected with some slight difference in the texture or composition of the stone on which it is formed: for I have repeatedly observed that after a careful removal of it, its reproduction takes place to the same proportional extent in the same parts: and this difference in the degree of the efflorescence often takes place not by a gradual transition, but as abruptly as if the line of separation had been marked by a graver; so that the part of the surface on one side of the line shall be almost totally devoid of any efflorescence, while on the other side it shall resemble the accumulation of hoar frost on the small branches of a tree.

The saltpetre formed in summer scarcely appears to contain a particle of any calcareous salt: that formed in winter contains most evident traces of such a salt, though probably even in winter the amount of this is not much above one part in two hundred of the whole mass.

A frosty, clear, and dry state of the atmosphere is particularly favourable to the natural production of nitre: but there seems to be a limit to its formation, on the same spot, even under the most favourable circumstances; the quantity of the nitre not continuing to increase after it has proceeded to a certain extent.

In a moist state of the atmosphere the formation either does not take place at all, or goes on slowly: and if that state of the atmosphere which is unfavourable to the production of nitre continue a sufficient length of time, the nitre already formed gradually disappears. At the commencement of these observations I attributed the occasional disappearance of the nitre to its mechanical removal from the wall, and supposed that it must have been by accident brushed off: but repeated observa-

tions convinced me this was not the case, its disappearance proceeding as gradually as its previous appearance; besides which, had it fallen from the wall, I should most probably have found it on the pavement beneath, which never happened to me. It afterwards appeared probable, although I have never met with any condensed moisture on the surfaces submitted to the foregoing observations, that the aqueous vapour precipitated from the atmosphere in the state of it above alluded to, might dissolve minute particles of the nitre, and be absorbed with them into the substance of the wall; but on this supposition nitre ought to be found in lixiviating a portion of the stone taken near the surface. I have however made the experiment without detecting any nitre in the stone so taken. But, in opposition to the idea of the absorption of the nitre into the substance of the stone, I found the efflorescence disappear in more places than one during the severe frost of the present year (1814), at a time when, from the temperature of the stone, if not of the air also, the absorption here supposed could not have taken place; since, that temperature being below the freezing point, the aqueous particles would by congelation have been rendered incapable of dissolving the nitre.

It is deserving of notice, that such a spontaneous disappearance of the nitre, as has been just mentioned, took place antecedently to and during the late heavy fall of snow on January 18 and 19.

Wishing to ascertain whether the free presence of atmospherical air be necessary in the natural process under consideration, I selected a part of the wall on which the formation of saltpetre usually takes place to a considerable extent; and insulated about a square foot of its surface which had been previously brushed quite clean. It was insulated by means of a plate of glass, the edges of the frame of which were covered with a cement, so as to exclude any access of air between the glass and the wall. As the depth of the frame was not more than the third of an inch, the inclosed space contained but an inconsiderable quantity of atmospherical air. On the following day, October 29, I observed that a formation of nitre had taken place on the part of the wall within the glass, but that it was not so extensively diffused, nor so abundantly deposited, as had been usual before the application of the glass; and the

crystals, which were distinctly prismatic, were much more accurately defined, and larger, than I had ever before observed them; in consequence, probably, of the tranquil state of the medium in which they were formed. On the day following, October 30, the quantity was increased; but it remained stationary from that time to November 12, when it began to diminish; and on November 16, there was no longer any appearance of it: nor did it re-appear in the interval between November 16 and 29. In the mean time the efflorescence had not only taken place on the adjacent parts of the wall in the usual manner, but had been more than once brushed off and again deposited, while no increase had taken place in that originally formed within the glass.

On November 29, the exterior surface of the glass was, for a purpose to be mentioned presently, covered over with whitewash; which was not removed till January 8, 1814. No observation could of course be made on the appearance of the surface within the glass during the interval that the glass itself was covered with whitewash; but no nitre was visible on the removal of the whitewash on January 8. It had, however, re-appeared before the morning of January 10, partly in separate capillary prismatic crystals, which were much larger than on the former occasion, and reached from the surface of the wall to the inner surface of the glass; and partly in small flocculent tufts; the whole quantity of the nitre formed being much greater than, and the manner of its formation being very different from, that formation which took place within the glass on October 29 and 30. Still, the whole quantity was not nearly equal to that which was usually formed on the same surface when exposed to the free action of the atmosphere. The increased quantity, however, formed in January, compared with that formed in October, corresponds with the observation, that the natural production of nitre is much influenced by temperature: but it is worth mentioning, that while the nitre formed within the glass in January, occurred either in distinctly prismatic crystals or in flocculent tufts, that which was formed on the adjacent parts of the wall was of the granular character above described in page 174.

Having by the foregoing experiment satisfied myself with respect to the necessity of the free presence of atmospherical

air for the full effect in the spontaneous production of nitre, I wished to ascertain the nature of the connexion between the nitre formed and the stone on which it is formed; and particularly, whether carbonate of lime simply would be sufficient for its production. I therefore made a nearly liquid paste with distilled water and prepared chalk,* with which I covered the exterior surface of the glass that had been attached to the wall for the purpose already mentioned: but though nitre was repeatedly formed in the neighbourhood of the glass, not a particle appeared on the whitewash during the space of nearly six weeks, from November 29 to January 8.

The foregoing statement contains the general results of all the observations I have hitherto been able to make on the present subject. I subjoin an imperfect analysis of the stone of which the laboratory of the Ashmole Museum is built, and of the saltpetre periodically formed on it; concluding with a few remarks on the local differences connected with a more or less extensive formation of that substance, and on its probable or rather possible source.

The stone of which the laboratory is constructed belongs to one of those alternating series of clay and sand, and calcareous freestone, of which the varieties of Bath stone form nearly the lowermost strata; and the Headington stone, of which the greater part of Oxford is built, the uppermost. It is principally made up of the *debris* of small sea shells, but frequently contains organic vegetable remains, and always some proportion of sand and ochry clay.

Six portions of this stone, taken from different parts of the laboratory, each weighing at least two hundred grains, were separately submitted to the action of a sufficient quantity of diluted muriatic acid. The undissolved residuum, which amounted in no instance to as much as four parts in a hundred, consisted of a yellowish brown ochry clay, mixed with a few particles of white sand, and small laminar fragments of a dirty-white colour, very much resembling portions of the siliceous

* As chalk sometimes contains magnesia, and almost always a small proportion of silex and alumine, I intend on a future occasion to repeat the experiment, using very finely pulverized crystallized calcareous spar, instead of chalk.

incrustation of the Geyser spring. Small flocculent shreds slowly subsided in the muriatic solution, derived probably from the membranous part of the shelly matter of the limestone; for this insoluble residuum, when thrown into red hot nitre, slightly deflagrated, and gave out an odour resembling burnt bones: and as this residuum had been collected without the use of a filter, the inflammable matter could not well have been derived from any other source than the stone itself.

The muriatic solution contained a small proportion of iron, and gave a very slight trace of magnesia. So that the composition of the stone may be thus stated:

Carbonate of lime	96
Oxide of iron, sand, ochry clay, and animal membrane	4
	100

In offering the following imperfect analysis of the saltpetre produced in the situations above alluded to, it is necessary to state, that the quantities on which I have hitherto had it in my power to operate have been very small.

Some preliminary experiments made on a solution of saltpetre which had been formed during the summer, gave the following results.

The solution contained no disengaged acid or alkali, and, upon the addition of oxalate of ammonia, afforded the slightest possible evidence of the presence of lime. It contained minute portions of sulphuric and muriatic acid. A portion of it being evaporated, left a mass of crystals which, in their form, as in all their other characters, exhibited the properties of nitrate of potash.

As it is usually stated by writers who speak of the subject, that nitrate of lime is a principal constituent part of saltpetre formed by a natural process, I was much surprised by the very slight trace of lime evident in the present instance; though I had felt assured previously, that but little would be found in the natural saltpetre which I have had an opportunity of examining; having never observed in it any tendency towards deliquescence. Having had frequent occasion to suppose that carbonate of lime is much more readily soluble in water than is commonly believed, and having never been able to detach

the saline efflorescence in question from the walls of the laboratory, &c. without admixture of particles of the limestone, or of the whitewash, amounting to at least seven or eight parts in a hundred, it struck me, that these particles might be the source of the lime rendered evident by the addition of the oxalate of ammonia in the solution of the saltpetre. I therefore pulverised small portions of calcareous spar, of the common limestone of this country, and of whitewash; and having agitated accurately distilled water, at the common temperature, with each of these portions, I then filtered the water, and tested it with oxalate of ammonia. In each instance, there was fully as copious a precipitate as when the oxalate of ammonia had been added to an equal quantity of the solution of saltpetre.

Similar preliminary experiments having been made on some saltpetre detached from the same part with that already submitted to examination, but formed during the winter instead of the summer, the same results were obtained, with this single difference, that the precipitate obtained by the addition of oxalate of ammonia was much more copious: and I found this to be the case from whatever part of the laboratory or elsewhere the saltpetre had been detached, provided it had been formed during the winter. I could not extend the experiment on the saltpetre formed during the summer, having only reserved a portion from one spot.

Judging from such experiments as I have made, it appears that the saltpetre, formed in the situations described in this paper, consists of full 99 parts in 100 of nitrate of potash; with a very minute proportion of some calcareous salt, which is either not at all present in the saltpetre formed during summer, or is present in smaller quantity than in that formed during winter—though even in the latter instance it scarcely amounts to one part in 200.

The proportion of sulphuric and of muriatic acid, and the bases with which these acids are combined, I have not attempted to ascertain, on account of the minuteness of the proportion in which they evidently exist.

In considering the relative situations of the different parts of the laboratory, and of the other buildings also, in which salt-

petre is naturally formed, it is evident, that the efflorescence takes place only where the exterior of the wall on which it is formed is either exposed to the direct influence of the weather, or is in contact with the adjacent ground; not taking place at all in those instances in which the wall is neither exposed to the weather on either side, nor is in contact with the adjacent ground: from which it might be argued, that the effect depends upon the action of the external air, or of the moisture of the ground transmitted through the substance of the wall: but the result of that experiment, in which the action of the air on the interior surface of the wall having been prevented by the intervention of a glass, the formation of nitre took place only to a very slight extent, is in a great measure at variance with such a supposition.

Again: though it is evident that the natural production of the saltpetre is closely connected with changes in the state of the atmosphere, those changes relating not only to its temperature but also to the degree of its moisture and barometrical pressure; yet a much longer series of observations, and these not partial like the present, but carried on in various parts of the world, is requisite, before even this part of the problem can be accurately solved. There still would remain a part of much more difficult solution, namely, the source of the metallic base of the alkali of the nitre.

With respect to this difficult question, if we compare the elements present in the composition of the saltpetre formed, with the elements of the substances present during its formation, it seems a reasonable conclusion that the potassium, or the metallic base of the potash of the saltpetre, is either a simple principle of some of the elements present, or that it results from the union of two or more of those principles, or of two or more of the elements themselves.*

The gross compounds present during the formation of saltpetre, in the instances mentioned in this paper, are atmosphe-

* The terms "element" and "principle" are here used in the same relation to each other as the early physical philosophers used the terms στοιχεια ἀρχαί. They supposed that the former, though incapable of decomposition by common means, were not necessarily to be considered as absolutely simple substances: those absolutely simple substances they expressed by the term ἀρχαί.

rical air and the limestone on which the saltpetre effloresces; and all the component parts of these may be ultimately resolved into the following elements—oxygen, nitrogen, hydrogen, and carbon, together with iron and the metallic bases of some of the earths.

The component parts of nitrate of potash, of which the saltpetre under consideration almost entirely consists, are nitric acid, water, and potash; which may be resolved into the following elements—oxygen, nitrogen, hydrogen, and potassium: and all these elements are experimentally known to be present in the situations where saltpetre is formed, with the exception of potassium.

In the supposition then that the saltpetre is a product and not an educt of the above process, since no potash can be detected either in the air or limestone, the potassium must either be contained in a free state in the atmosphere or in the limestone, which from its remarkable attraction for oxygen is inadmissible; or it must be a component principle of some one of the elements present; or lastly, it must be itself a compound of two or more of the principles of those elements, or of two or more of the elements themselves.

But I am aware that the saltpetre may be considered as an educt of the process, and that it may possibly exist already formed in the atmosphere in a state of minute division: yet, when we consider the comparatively fixed nature of that salt, and that no experiments have yet detected its presence in atmospherical air, or in the moisture precipitated from atmospherical air; and lastly, when we reflect on the probability that the metals, of which potassium is one, are compound bodies, the former supposition seems upon the whole preferable to the latter.

February, 1814.

An Account of some Experiments on Animal Heat.

By JOHN DAVY, M. D. F. R. S.*

[From the London Philosophical Magazine and Journal, for Dec. 1814.]

THE recent inquiries of Mr. Brodie have rendered questionable the different prevailing hypotheses relative to animal heat, and have shown that fresh investigation is necessary, before we can expect to arrive at any accurate theory.

In the present uncertain state of our knowledge, three circumstances are particularly deserving of attention, viz. the relative capacities of venous and arterial blood for heat, their comparative temperatures, and the temperatures of different parts of the animal body.

On the first of these subjects we possess only the experiments of Dr. Crawford, which I believe have not yet been repeated, notwithstanding they form the basis of his hypothesis.

On the second, little inquiry has been made, and especially of late years, since the improvement of the thermometer.

And on the third, the observations that have been collected are very few in number, and, with the exception of those of Messrs. Hunter and Carlisle, are scarcely, perhaps, deserving of confidence.

Such were the inducements that led me to the consideration of each of these subjects apart, and to endeavour to acquire by experiment some more certain knowledge respecting them. The experiments that I have made will be described in the two following sections, and in the last will be offered the few remarks and conclusions which naturally arise, and are fairly deducible from the results.

1. *On the Capacities of venous and arterial Blood for Heat.*

I must premise, that my object has been to endeavour to ascertain the relative capacities of venous and arterial blood for heat, rather than their exact specific caloric. The latter, from many circumstances, is difficult to be accomplished; whilst the former is comparatively easy, and in a theoretical point of view is probably equally useful.

* From the Philosophical Transactions for 1814, part ii.

I have employed both the methods commonly used. I shall mention most of the experiments that I have made, without noticing the repetitions of them, and shall begin with those on the times of cooling of equal volumes of venous and arterial blood.

The blood used was from the jugular vein and the carotid artery of a lamb about four months old. It was received in bottles; and to remove the fibrin, which is a great impediment in experiments of this kind, it was immediately stirred with a wooden rod. In respect to colour, the difference between the venous and arterial blood was not so great as in the sheep's; and this in a great variety of instances I have always observed, the venous being of a less dark hue. The specific gravity of the venous blood, without the fibrin, was found to be 1050, and that of the arterial 1047.

A glass bottle equal in capacity to 2518 grains of water, and weighing 1332 grains, was filled respectively with water and venous and arterial blood of the temperature of the room 62, about four hours after the blood had been drawn, during which time each bottle had been closely corked. A delicate thermometer, by means of a perforated cork, was placed in the middle of the liquid. The bottle was then plunged into water of the temperature 140 Fahrenheit; and when the mercury had risen to 120, the bottle was quickly wiped and suspended in the middle of the room, and the progress of cooling was noticed every five minutes, till the thermometer had fallen to 80. The following were the general results obtained:

Water cooled from 120 to 80 in 91 minutes.
Arterial blood in 89
Venous blood in 88

Considering therefore the capacity of water for heat to be denoted by 1000, neglecting the effect of the glass bottle producing a difference only of about half a minute, and the same in each instance, and dividing the times of cooling by the specific gravity, the relative capacities of venous and arterial blood without fibrin appear to be as ·921 and ·934.

In the following experiments the same kind of blood and the same quantity was used as in the preceding. The mixtures were made in a very thin glass receiver containing a delicate thermometer. The temperature of the room was 66.

Hot water temperature 121; cold water 61. Mixture of the two 90, after two minutes 89, after three 88, and after eight 87.

Venous blood 121. Water 62·5. Mixture 89; after three minutes 88·5; after seven 87.

Arterial blood 121. Water 63·5. Mixture 89·5; after three minutes 88·5, and after seven 87.

Now, allowing about one degree of the cooling effect to have been produced by the receiver, indicated by the admixture of the hot and cold water, calculating the quantity of blood used from the knowledge of its volume and specific gravity, employing the formula given by Professor Robison, which consists in multiplying respectively the weight of the water and the blood by the change of temperature, and dividing the first product by the second, the quotient or specific caloric for venous blood appears to be as ·812, and for arterial as ·814, results very similar to those I have obtained with the blood of the sheep.

In the remaining experiments, blood with the fibrin present was employed, and, with this exception, they were perfectly similar to those already described.

The blood used to ascertain its time of cooling was obtained from a sheep; and one day the vein was opened, and on the next the artery. The capacity of the bottle employed exceeded that of the first by one ounce measure of water; but it was equally thin. The air of the room was of temperature 69.

Water cooled from 120 to 80 in	118 minutes
Venous blood in	112
Arterial blood in	113

And hence, as the latter was of specific gravity 1049, its capacity for heat seems to be as ·913; and as the former was of specific gravity 1051, its capacity appears to be ·903.

In the following experiment, equal volumes of fluid blood and of water were used; which was easily accomplished by means of a thin bottle with a large mouth, to which a cork was adapted, with a perforation more than sufficiently large to admit the bulb of a very delicate thermometer, and of course to allow, when the bottle was filled to the brim, the excess to flow out on the introduction of the cork, which was always similarly placed. To retard the process of cooling, the bottle was closely surrounded by a thick layer of what is commonly called cotton-wool. Its capacity was equal to five ounce measures of water,

or 2400 grains. It was first filled with cold water, which, when its temperature had been ascertained, was thrown into the receiver before used; it was next filled with hot water of temperature about 110, so that the heat of the glass might be nearly the same as that of the blood: and lastly, when the vein or artery had been opened, the bottle was immediately emptied and filled with blood, the temperature of which was ascertained by the thermometer in less than a quarter of a minute. The mixture now was instantly made, and by the same thermometer the highest temperature after mixture was discovered.

The four following trials were made on the blood of two lambs, both about five months old. The temperature of the air was 60.

Cold water 57·5. Venous blood 100. Mixture 80; after one minute 78·5.

Water 58. Arterial blood 103. Mixture 80; after one minute 79.

Water 58. Venous blood 101·5. Mixture 79; after one minute 78·25.

Water 58. Arterial blood 106·5. Mixture 81; after one minute 80.

The rate of cooling was not noticed after the first minute had elapsed, as the blood then generally began to coagulate. The specific gravity was only ascertained in the two last trials; that of the venous blood was found to be 1050, and that of the arterial 1049; and hence allowing, as before, one degree of the cooling effect to be produced by the receiver, the capacity of venous blood for heat appears to be ·852, and that of arterial blood ·839.

It is evident that these trials admit of less accuracy than the preceding; and much more confidence, it appears to me, is due to the third series of experiments; so that, if required, I should be inclined to give the numbers thence deduced, as the greatest approximation to the truth.

2. *On the comparative Temperatures of venous and arterial Blood, and of different Parts of the animal Body.*

To endeavour to ascertain the comparative temperature of venous and arterial blood, I have made a considerable number of experiments; some of which on lambs, sheep, and oxen, it

will be sufficient for me in this place to describe. In each instance, a long incision was made through the integuments; the jugular vein was laid bare, and the exact seat of the carotid artery found. The vein was then opened, and a small delicate thermometer introduced, and thrust about an inch up the vessel beyond the wounded part; and as the bulb of the instrument was small, the flow of blood was not stopped. When the mercury was stationary, its height was marked. The carotid artery next was divided, and the thermometer was immersed in the current of blood, and left there till it ceased to rise.

The following are the results of five experiments made on lambs, all of which were about three months old. The thermometer in the shade stood at 65.

1.	Venous blood 102·5	Arterial blood 104
2.	—————— 104	—————— 105
3.	—————— 104	—————— 105
4.	—————— 103·5	—————— 105
5.	—————— 104	—————— 105

The following results were obtained from three experiments on sheep, whose exact age I could not ascertain. The thermometer in the shade was 60.

1.	Venous blood 103·5	Arterial blood 104·5
2.	—————— 102·5	—————— 104
3.	—————— 103	—————— 104

The experiments on oxen were only two in number. The temperature of the air was 64.

1.	Venous blood 100	Arterial blood 101·5
2.	—————— 100	—————— 101

In both instances the oxen were knocked down before the vessels were opened; and as respiration had ceased in consequence of the injury of the brain and spinal cord, no difference of colour, of course, was perceptible between the blood from the jugular vein and that from the carotid artery.

These results, so different from what might have been expected, from the observations of Messrs. Coleman and Cooper on the temperature of the two sides of the heart, led me to repeat their experiments. The experiments in which I place most confidence were made on lambs about four months old, and to these I shall confine myself at present. In each instance the animal was killed by the division of the great vessels of the

neck; an opening was made immediately into the thorax, and a very delicate thermometer was introduced into the ventricles of the heart by means of a small incision. The operation occupied so short a space of time, that in three instances the right auricle had not ceased contracting.

1. Venous blood. 104	Left 106
Arterial . . . . . 105·5	3. Rectum 105
Rectum 104	Right ventricle . 105·5
Right ventricle 105·5	Left . . . . . 106·5
Left 106	4. Rectum 105
2. Rectum 105	Right ventricle . 106
Right ventricle 105	Left 107

I cannot well explain the difference which exists between the results of the preceding experiments, and those of Messrs. Coleman and Cooper, which are directly opposite. Can the mode in which the animals they experimented on were put to death, be the cause of the want of agreement? In death by asphyxia, there is generally an accumulation of blood in the right ventricle; and in many instances I have observed, when the right ventricle has been distended with blood, little difference of temperature between the two sides of the heart.

To describe all the experiments that I have made to ascertain the temperature of different parts of the animal body, would extend this paper to an unusual length, and there is the less occasion for a long description, as the comparative results were very similar. It will be sufficient therefore here to notice the observations made on the human body, and on that of a lamb.

That the thermometer might be equally applied to all parts of the surface, its bulb, in form nearly cylindrical, was fixed to a small piece of cork, hollowed and lined with fine wool, and thus half its superficies was applied in each instance. The observations were made on the naked body at seven A. M. immediately after quitting bed. The temperature of the air of the room was 70. The following were the results obtained:

At the central part of the sole of the foot 90

Between the malleolus internus and the insertion of the tendo Achillis, where the artery is felt 93

Over the middle of the tibia . . . . . 91·5

On the middle of the calf 93

Over the popliteal artery at the bend of the knee . . . 95
Over the femoral artery in the middle of the thigh . . 94
Over the middle of the rectus muscle 91
Over the great vessels in the groin . . . . . 96·5
About a quarter of an inch below the umbilicus 95
Over the sixth rib on the left side where the heart is felt pulsating 94
Over the same place on the right 93
Under the axilla, the whole surface of the bulb being applied 98

About an hour had now elapsed from the commencement of the experiment. The thermometer again applied to the sole of the foot rose no higher than 85, five degrees less than at first. A disagreeable sensation of cold was experienced, and particularly in those parts not supplied with large vessels, and out of the course of the great arteries. The body remained unpleasantly chilly till breakfast had been taken, and then a slight degree of pyrexia was perceived; the heat of surface being increased, the pulse quickened, and the mouth slightly parched. After breakfast, the thermometer was applied to both hypochondriac regions, and the left was found one degree higher than the right.

To ascertain the temperature of different parts of the surface beneath the integuments, the bulb of a thermometer was introduced through small incisions about half an inch between the skin and subjacent parts of a lamb just dead. The heat of the rectum was first ascertained, as a mean of marking the rate of cooling, and the different parts were then tried in the following order:

Venous blood in the jugular vein . . . . 105·5
Arterial blood from the carotid artery 107
Rectum . . . . . 105·5
Over the metatarsal bone 97
Over the tarsal bone 90
Over the knee joint 102
About the head of the thigh 103
At the groin 104

Nearly a quarter of an hour had been occupied in making these observations, and the temperature of the rectum was now

found to be 105. The three great cavities were next opened in the order enumerated.

Near the lower part of the liver . . 106
The substance of the liver . . . . . 106·5
The substance of the lung . . . . . 106·5
The left ventricle 107
The right ventricle 106
The central substance of the brain 104
Rectum . . . . . 104·5

Surprised at the temperature of the brain being lower than that of the rectum, I was led to repeat the experiment. It may be proper to notice a few of the results, as it is a curious circumstance which they confirm. The four experiments I shall mention were made on lambs. As soon as the animal was dead, the cranium was perforated, and a delicate thermometer introduced into the central part of the brain.

1. Brain 104 Rectum 104·75
2. Brain 104·75 Rectum 105·5
3. Brain 105·5 Rectum 106·5
4. Posterior part of the brain 105·5; anterior 103. Rectum 106·5.

The temperature of the air at the time was 68. Different parts of the brain were found to vary considerably in temperature; the anterior, as already noticed, being lower than the posterior, and the superficial than the deep-seated parts.

3. *Remarks and Conclusions.*

That there is no material difference between venous and arterial blood in respect to specific caloric, excepting what arises from difference of specific gravity; that the temperature of arterial blood is higher than that of venous; and the temperature of the left side of the heart, than that of the right; and lastly, that the temperature of parts diminishes as the distance of the parts from the heart increases—are the general results of the preceding experiments.

Admitting the accuracy of these experiments, and I think that they will be found correct when repeated, what are their consequences in a theoretical point of view?

They are evidently in direct opposition to Dr. Crawford's hypothesis; the essence of which is, that the capacity of arterial

blood for heat is greater than that of venous, that there is no difference of temperature between the two ventricles of the heart, and, in fact, that the heat of all parts is nearly the same.

They are more agreeable to, and indeed they even support, the hypothesis of Dr. Black, that animal heat is produced in the lungs, and distributed over the whole system by means of the arterial blood.

Neither are they inconsistent with that hypothesis which considers the production of animal heat as dependent on the energy of the nervous system, and arising from all the vital actions constantly occurring.

Besides the results of the preceding experiments, many arguments may be advanced in opposition to Dr. Crawford's hypothesis.

As we never perceive a difference of capacity in bodies without a difference of form or composition; and as very slight differences of the former result only from great changes of the latter, it might be expected *a priori*, as no difference, excepting that of colour, has been detected between venous and arterial blood, that their specific caloric would be very similar. From analogy also, it might have been expected, that the capacity of arterial blood for heat would be much less than that of water, as water appears to exceed almost every other fluid, and as the capacity appears to diminish as the inflammability of compounds increases. But the strongest arguments against this hypothesis are to be derived from the recent experiments of Mr. Brodie, and those of MM. Delaroche and Berard.

Dr. Black's hypothesis appears to me far more satisfactory than Dr. Crawford's, and capable of explaining a much greater number of phenomena; but there are objections even to this hypothesis, which must be removed before it can with propriety be received.

The last hypothesis, which I mentioned, that which refers animal heat to vital action, has many facts in its support, and especially the results of Mr. Brodie's curious and interesting experiments; and the results of my inquiry, as I have already observed, are not incompatible with it. It may be said, that the viscera of the thorax and abdomen are of highest temperature, because these parts are, as it were, the elaboratories of life; and that the heat of the arterial blood, and of the parts best supplied

with this fluid, is greatest, because they lie deepest and abound most in the principle of life or vital action. This explanation was suggested to me by my brother Sir H. Davy. There are some facts which I have observed agreeable to it, but not more so than to the hypothesis of Dr. Black. I have found the stomach of the ox, the pyloric compartment, of a higher temperature than the left ventricle itself: thus, when the latter immediately after death was 103, the former full of food was 104·5. I have also found the temperature of young animals, in whom all the vital actions are most energetic, higher than that of animals arrived at maturity. I may mention here, in illustration of this statement, a few observations made on infants, as I am not acquainted with any yet published. In one instance I found the heat under the axilla of a child just born 98·5; after twelve hours 99, and after three days, the same; during the whole of which time it appeared in perfect health. On five other children of the same age, similar observations were made. In two instances of weak infants, the temperature, one hour after birth, was found not to exceed 96, which is two degrees below the standard heat of man in a state of health; but their respiration was still languid, and the next day the heat of the axilla had risen in one to 98·5, and in the other to 99.*

To conclude: As, in each hypothesis examined, difficulties are found to exist from facts or the results of experiments of an unbending nature, we must at present either suspend theory altogether and search for *experimenta crucis*, or adopt that hypothesis which is conformable to the greater number of facts. The first measure is certainly most philosophical; but to the latter we are naturally most inclined; and if I were questioned which view is preferable, I should make no hesitation in selecting Dr. Black's, which to me appears both most simple and most satisfactory.

* The opinion of Haller, I am well aware, is contrary to these results, as is expressed in the following paragraph: "Viri feminis calidiores duriori nempe sunt fabrica, contra pueri aliquanto minus calent quam adulti homines, ut modo natus puer vix calorem conservet, nisi sollicite et copiose vestibus textus."—Elem. Phys. ii. p. 297. As this great physiologist seems to have drawn his inference merely from the circumstances mentioned, it can have little force, except from the authority of the author; to which may be opposed an equal authority, not less than that of Hippocrates himself: he says, in his fourteenth aphorism, "Qui crescunt plurimum habent calidi innati: senibus autem paucus calor."

On the Cultivation of Senna.

[From the Raleigh Star.]

MESSRS. EDITORS,

I UNDERSTAND that Senna has lately advanced in price three hundred per cent. It is a most valuable article of medicine, and perhaps its increased price is not to be regretted, as it will make us acquainted with our own resources, and compel us to improve them.

Some years since, the Medical Society of North Carolina (a valuable institution, which I am sorry to perceive is inactive and languishes, if it be not extinct) offered a premium for the production of the largest quantity of Senna, exceeding 40 pounds, raised by one person in one year. I accordingly sowed about a quarter of an acre, and obtained between fifty and sixty pounds of Senna, which physicians have said was much superior to the coast of Barbary Senna, and equal to the best which comes from the Levant.

Since Senna bears a high price, and is not easily obtainable at any price, I have hoped, that every person who keeps a garden, will not in future subject their means of health to the will of a foreign despot; and in this hope I am induced to send you for publication the information necessary to be known by those who are desirous of cultivating this valuable article.

It is a delicate plant, sensible to cold, rains and drought: The seeds should be committed to the earth about the first of May; the ground should be mellowed and the seeds planted in rows, covered an inch deep and four inches asunder.—The rows should be a foot or two apart, so as to admit of being worked, and the only tillage necessary is to keep it clear of weeds and to earth it moderately. If the season is dry or the soil thirsty, it would be benefited by an occasional watering. The plant in good soils grows to two-thirds of the height of indigo, but spreads more. The leaves (the valuable part) grow on long stems issuing from the trunk and branches.

Besides a drought, the Senna is exposed to another formidable enemy. When in bloom it is visited by a yellow butterfly which deposits its eggs upon the leaves in vast abundance.—

These eggs in a few days become worms, which destroy the leaves. I know no means of preventing the visitation of these troublesome flies, nor any expeditious mode of staying the advances of these eggs to the animal state. Sprinkling ashes over the shrubs has been recommended by some, and has suggested itself to me, as a probable means of being useful in both cases, but I have never tried it. The only mean which I have attempted was to brush off the eggs with a wing where I have detected them. This is a work of some labour. The eggs are small and white, and will not be observed without minute inspection. The later in the season the plant is in coming to maturity the more liable it is to the depredations of this butterfly progeny. Hence the propriety of bringing it forward as early as the season and its tender nature will permit.

The Senna is to be gathered once or twice a week as the plant is going on to maturity. When the lower leaves have gained their full size and begin to change their colour a little, pluck off a few courses of the lower stems: wilt them two or three hours in the sun, then spread and dry them in the shade, pick out the stems, put up the leaves in bags suspended in an airy dry situation.

The seeds are contained in pods which grow at the extremity of the stalk and its branches. As they ripen they become black and fall off. Gathering the leaves does not at all injure the production of seed.

A light rich soil is best. If sandy, it is liable to suffer from drought.

Senna is now *two dollars* a pound in Petersburg. The product of a quarter of an acre would be worth a hundred dollars. The value of the labour is so inconsiderable as to make a very small deduction from this amount. It would be profitable to cultivate for sale and export. But every family ought to cultivate it for private use. It is a most valuable cathartic, perfectly safe, mild in its operation, and a most powerful evacuant of bile, and as far as my observation extends, much superior to jalap and calomel, and certainly much preferable to those drastic drugs. It renders the operation more mild to add a few coriander or fennel seeds to it when a decoction is to be prepared.

JOHN WHITAKER.

Wake county, April 3, 1813.

SELECTED REVIEWS.

A Practical Explanation of Cancer in the Female Breast, with the Method of Cure, and Cases of Illustration. By JOHN RODMAN, M. D. One of the Surgeons and Medical Superintendants of the Dispensary and House of Recovery of Paisley. 8vo. pp. 240. London, 1815.

[From the London New Medical and Physical Journal, for May, 1815.]

IN taking a survey of the whole catalogue of "ills which flesh is heir to," there is not one which strikes such horror into the human mind as that which is the subject of the volume before us. If hydrophobia be terrific in its appearance, and almost invariably fatal in its result, still the victim of its fury is soon released from corporeal sufferings by the welcome hand of death. If pulmonary consumption be almost as certain in its melancholy termination as hydrophobia, while its career is often long protracted, yet the patient's sufferings are comparatively trifling, and hope gilds every prospect till the last curtain falls!—Not so in Cancer,—there agonizing pain of body keeps the sympathising mind perpetually on the rack, and hope, "which comes to all," but rarely illumines the gloomy prospect of the unhappy patient. The ravages too of this dreadful disease, though accompanied with such torment, are cruelly slow. A fœtid and horrid-looking ulcer gradually destroys every thing in its way, till the bones themselves are corroded, and the patient sinks from the general and local irritation, or from the repeated hæmorrhages occasioned by the destruction of those arteries that lie within the range of the malady!

No part of the human frame, in either sex, is so frequently the seat of Cancer, and also of those tumours which have been mistaken for incipient cancers, or schirrhi, as the female breast; and it is the disease, as it affects this particular organ, which our author has selected for his Essay. After so many authors had written on this disease, without explaining its nature or offering any thing like a successful method of treatment, we confess that we opened the work with a gloomy presentiment that this would but swell the catalogue, without in-

creasing our stock of knowledge, or furnishing us with any means of combating the evil. The work, however, turns out to be something like the Alchemist's search after the Philosopher's Stone, whereby many things were found which were never sought for; since the whole drift of our author's reasonings tends to prove, that there is no such thing as Cancer of the breast; at least, that there is nothing peculiar in Cancer, but what arises merely from the nature of the parts attacked with inflammation and ulceration. In his endeavours to establish this doctrine, if he is unsuccessful in his object, he has conferred a very great obligation on the profession, by pointing out and drawing their attention to those numerous cases of indurated *mammæ* which the routine practitioner heedlessly pronounces to be of a schirrhous or cancerous nature, and either advises extirpation, or sows the seeds of alarm and misery in the patient's mind, thereby greatly aggravating the original disease, which, by soothing treatment and mild yet judicious applications, might have been entirely removed. In showing, therefore, how much may be done by medicine and regimen for the removal of tumours which are *suspected* to be schirrhous, Dr. Rodman has given us a more useful book, than any which could have been written by the ablest practitioner on Cancer itself.

We must be allowed to observe, *in limine*, that although Dr. Rodman is perpetually railing against theorists and men of genius, there is scarcely a page of his own work which does not contain theoretical speculations, which in most instances are palpably obscure, we had almost said unintelligible, and conveyed in the most unhappy, the most uncouth, and often the most ridiculous language. Mixed up with these defects and blemishes, we can clearly discover genuine good sense, acuteness of observation, and judicious practice; circumstances which amply compensate for the imperfections alluded to, and which we point out as independent and unbiassed Reviewers, for the sake of the author himself, who will doubtless profit by the honest and disinterested advice herewith offered.

The work, though formally divided into chapters, is so singularly devoid of method or arrangement, that it almost bids defiance to any attempt at analysis. By a careful perusal indeed of its contents, we could, from the impression on our memory,

convey to our readers a very just conception of our author's opinions and practice, in our own words; and to this plan we shall be forced to resort, in most instances, during the present critique.

The first chapter, "The feeble structure of the female constitution," conveys to us, with endless circumlocution and obscurity of language, the knowledge of a fact which is familiar to all medical men of reflection and observation, but which is little attended to by the host of routine practitioners; namely, that in both sexes, but particularly in the female, certain affections of the mind have a powerful influence in deranging the functions of the body, more especially the functions of the digestive organs.

"There is an affection," says our author, "with which females are afflicted, appearing next to that of an inherent or universal disease among them, and this is a state of the stomach whereby digestion of food is often imperfectly performed; and during such a state, the bowels are usually constipated. The effects resulting from both of these occurrences upon all the system, are indubitably hurtful." p. 7.

This is true; and it might also have been remarked, that disordered states of the digestive organs arising from other causes than mental emotions, produce and aggravate that fickleness of mind and irritability of temper, which in their turn re-act on the corporeal functions. So intimate, in short, is the sympathy or connection between mind and matter, in these cases, that it is generally impossible to say where the malady originally commenced.

In the second chapter Dr. Rodman treats of the "disposition of mammary glands, and origination of tumours." After remarking on the complicated and vascular texture of the female breast, he thus proceeds to account for the "origination of tumours."

"Even in the best of health, each gland, to a certain extent, swells and subsides frequently, from the quantity of fluids which enter the vessels at one time and leave them at another, so that their contents are often varying in bulk. This variety of contents arises from several causes, but one is the power of uterine influence, by which, at the catamenial periods, fluids are injected into the vessels more abundantly than at the times intervening. And during such a state, it is very

usual for partial obstructions to occur, and small knots to form in the body of the breast, without exciting troublesome feelings, or requiring any extraordinary attention. Knots of this kind are generally of short duration, and being customary, exist many times unnoticed." p. 17.

If this be the case in health, our author asserts that it is still more so in disease, and in fact, that mental commotions and corporeal ailments augment, if they do not occasion the generality of mammary enlargements. Two of the principal external causes of the origination of tumours in the female breast are long pressure and sudden violence. Of the former, *tight lacing* is the most prominent and dangerous, since, as it acts gradually, and the feelings from it are not severe for some time, it meets with less attention.

"But this leads me," says Dr. Rodman, "to notice what I have already mentioned, that the mammary vessels, even when healthy, are naturally subject to a state of periodical plethora; a state which is afflictive only when the body is diseased and irritable. Now, if weakness and irritability of the frame, catamenial excitation, and diseased turgidity and tenderness of the breast, in consequence of pressure, be all experienced at the same time, the individual is greatly disordered, and becomes one of those vexatious cases, wherein Mr. Abernethy says, the mammary gland seems to be a nidus for carcinomatous action." p. 21, 22.

The effects of external violence occasioning tumours in the female breast need not be dwelt upon, nor those indurations resulting from milk abcesses, or milk gorged in the breasts from early weaning. But it is useful to bear in mind, that under all these circumstances, the application of cold is singularly powerful in producing swelled lymphatics, or lacteals thickened and tense like small cords, with numbers of bulky or clustered glands dispersed over several parts in the body of the breast. It is generally at these times, when the breast is suffering from affections of cold, that shooting pains occasion so much alarm to the patient. The second section, or remainder of this chapter, entitled "*Probable affections*," is entirely filled with unintelligible theory, while our author is every where exclaiming against genius and speculation!

The third chapter, on "The locality of mammary disease

arising from affections of the mind," is more interesting, and exhibits our author in a favourable view. He very justly observes, that a large class of females "disregard the concerns of health, as though it were unworthy of esteem," till it is lost, or till some painful affection (especially a mammary one) rouses their attention, and then life seems highly precious, and they are all alarm for its safety! Our author asserts and we have reason to believe his assertion, that when the mind of a female is rendered anxious by, and her attention drawn to, any painful sensation in the mamma, the local affection is so much under the influence of mental agitation, that it is almost instantaneously aggravated thereby, and continues to fluctuate according to the state of the *mind* as well as of the body, throughout the disease. He justly observes also, that there is a peculiar sympathy which reigns amongst females respecting cancer in the breast, that causes the most afflictive sensations of alarm, when any friend or acquaintance is distressed with a mammary tumour named cancer. The idea of a lingering and painful disease, or a terrible operation, preys upon their minds.

"Hence, the lively conception of sufferings from the mammæ of others, affects these organs in themselves, by their attention resting upon them, which, in progress of time, occasions a painful plethora of a similar part." p. 57.

Though this may be termed a *fanciful* doctrine, we believe it to be founded in fact, and it points to useful hints in the method of treatment. This supposition explains the fact of mammary affections being more active in some districts than in others; and also why, as practitioners have often remarked, an unusual number of females apply for medical advice respecting diseased breasts immediately after the amputation of a cancerous mamma in the neighbourhood. It may also explain why the disease has even been considered hereditary, since it is natural to suppose, that the daughter who has long witnessed the sufferings of a cancerous parent may be easily led to conclude, that every pang in her own breast is only a prelude to what her mother endured from cancer of the same organ.

Dr. Rodman brings forward cases illustrative of this sympathetic affection of the breast, which are sufficiently convincing, but we deem it unnecessary to quote any of them.

In the fourth chapter our author endeavours to show, that on real criterion of *schirrhous* tumours exists; and, in short, that all tumours may become what is termed cancerous, if neglected or mismanaged, the whole phenomena being the result of inflammation, preceded, in general, by local plethora, and mental or corporeal disorder.

"When such a state of inflammation is repeatedly occasioned, the small glandular bodies around the tumour continue to harden, and adhering to its surface, become part of its body. The morbid production depends upon the frequency, and also upon the continuance of the inflammatory process, both for its bulk and for its figure. The hardness results likewise from similar causes; and as for the *arrangement of fibrous texture*, in the internal structure of a diseased mass, it seems to occur in consequence of *various degrees of the inflammatory process*, by which, taking place while the body is afflicted with different degrees of indisposition, may be viewed as almost sufficient to produce an endless variety." p. 81.

Now, although we are unable to offer any explanation of that singular "*arrangement of fibrous texture*," which distinguishes cancer, or rather schirrhus, and from which it probably derived its name, yet we believe that few medical men will consider the elucidation of our author as at all satisfactory. The ligamentous bands which issue from the nucleus of the tumour, *like radii from a centre*, are not what might be expected from successive and various degrees of inflammation, for in the latter case they would be like the layers of an onion, or circling round, instead of issuing from a common centre. But it is time to leave theory and return to practical points.

The fifth chapter is entitled "The Influence of Cold."

After some judicious remarks on the delicacy and susceptibility of the female constitution, Dr. Rodman proceeds thus:—

"It has already been seen, that indigestion is a very common and hurtful complaint among the sex. Every thing, therefore, which has a tendency to this complaint, tends infallibly to increase the disposition to disease. If they be over-heated and fatigued, then for some time exposed in this state to a current of cold air, or other cold medium, the sense of immediate injury may, perhaps, be trifling; yet sickness at stomach, and an unhealthy colour of the excretions, are apt to come on the following day. Not only so, but a considerable languor of body,

and an increased constipation of the bowels will often be experienced for a day or two after an occurrence of this kind." p. 87.

Dr. Rodman compares this to the action of cold on the female breast.

"When the body is much cooled, either by the action on the trunk, or by the cooling process on the extremities, the sense of chilliness is stronger in the diseased breast than in any sound part. Each chill is felt in its passage, and lodges in the breast with painful sensations." p. 88.

Dr. Rodman instances the disease commonly called a "*weed*," originating, as is well known, in cold caught during the puerperal state; a condition of body susceptible of atmospheric transactions.

We shall condense a few of Dr. Rodman's cases, for the sake of showing his practice. At page 93 commences the case of Mrs. H. aged 30, mother of three children. After having been fatigued by washing, and exposed during perspiration to currents of air, she was affected with a glandular swelling in the right breast, which resisted the usual applications for three months, when our author was consulted.

"Upon examining the part, the tumour was found to be oval, and nearly three inches in length. All the breast was swelled and tender, containing a number of distinct tumours scattered over different portions of the gland. Numbers of the lymphatic vessels were tight and bulky, the axillary glands were very large, and the surrounding substance was tumid, lumpy, and painful."

Twelve ounces of blood were taken from the arm, and a saline cathartic prescribed. The swelled parts were ordered to be fomented with a decoction of flor. anthem. et ex. hyoscyam.; after which they were to be dried and covered with wool. During a week this plan was continued, when

"—the swelling and tenderness of the mamma were abated —lancinating pains seldom and mild. The relief from pain and uneasiness has had a very happy effect in soothing the mind. The fomentations were resorted to twice a day for a week longer, according as any soreness threatened to return. Mild laxatives were prescribed—the breast and shoulder were rubbed with ung. camph. and both were strictly covered with

additional pieces of flannel. In the course of three months there was neither tumour nor induration in the mamma, nor swelled gland in the axilla, and twelve months afterwards there was no return of the complaint."

The next case adduced was of long standing before our author was applied to, and several medical men had been previously consulted.

"The first said, that the disease had all the symptoms of cancer, and advised her to the use of mercury. The second, that it was not yet cancer, but would soon be cancer. The third had no hesitation in saying it was cancer, and was sorry to add that there was no remedy; for though the breast were cut, the disease would return."

After this she had taken mercury, and used cooling applications to the part, which greatly aggravated the complaint. Dr. Rodman ordered the bowels to be opened, and a cataplasm, composed of chamomile decoction, lintseed meal, and a solution of mur. ammon. in which had been dissolved ex. hyoscy. to be kept to the parts.

In three days the swelling and pains were abated, and the poultice was only applied during the hours of sleep. The day time, the parts were occasionally rubbed with the tinct. saponis, and covered with cotton wool, after being washed with warm soft water, and dried, page 102. In a little time her mind became more tranquil as the corporeal disorder subsided, and in a short time she perfectly recovered.

The sixth chapter is a recapitulation of the preceding, and defies analysis, which, however, is unnecessary. Our author has strangely enough pitched upon this chapter to introduce the great body of his cases, some of which we shall briefly notice. The first, (p. 112) is that of a young female Highlander with a tumour in the left breast, accompanied by pains of a darting nature, and swelling and soreness in the glands of the arm-pit. She had been accustomed to a sedentary life, and was advised by our author to change it for a more active one, —to frequent a medicinal spring in his neighbourhood, to keep her bowels open, and pay attention to general warmth of clothing, and particularly to preserve a uniform temperature in the diseased gland by local coverings of flannel.

"In a few months, the mammary tumour vanished, as well as the tumours in the arm-pit."

The next case, p. 115, is that of a young woman, who had received a blow on the breast, succeeded by hardness and swelling. After hearing that a breast was amputated in the neighbourhood, her's became suddenly worse, and on applying to the operator was advised to have the tumour removed by the knife. In six days after this, the glandular swelling was of course much aggravated, and her mind was greatly disturbed.

"From the good state of her health, I had every reason to assure her that she had no danger to fear, providing she covered the breast with one or two folds of flannel, and took care to bathe it frequently with warm vinegar." She speedily lost all trace of disease.

In a chapter on the propriety of extirpating mammary tumours, there are many sensible remarks and shrewd observations. The following extract merits insertion.

"It deserves to be remarked, that a considerate surgeon is usually more averse, after he is advanced in life, and the knowledge produced by practice, to advise extirpation for a recent tumour of the mamma, than in early life with less experience. This circumstance would almost prove, that practical observations, in the treatment of such tumours, occasion fewer fears than those that are roused from the speculative notions entertained at first. When his mind is impressed with them, he is very apt to consider every bulky absorbent gland, whether swelled by cold or enlarged by common inflammation, as infected by some unknown but deadly agent. Hence the patient is liable to undergo a painful operation for the cutting out of all these enlarged glands; or may be doomed to a state of fatal misery, from hearing that the distemper is pronounced incurable, which leaves her without hope, and subjects her to the destructive influence of despondency. Yet the absorbent glands, as may be seen from the foregoing cases, are often swelled in a few hours, and with proper management, the swelling can be subdued in an ordinary space of time." p. 195.

The ninth chapter is on "the Ulcer of the Mammary Induration, commonly called Open Cancer," and our author's theoretical explanations of the phenomena are mysteriously sublime, and most happily unintelligible. The following is one of the most luminous passages.

"The over abundance of matter causes a greater proportion

to be settled, and to adhere upon the surface, where, by the activity of the putrefactive process, to which this ulceration is disposed, encouraged by the power of animal heat, and the septic application used, it soon corrupts. The corruption increases the acrimony of this matter, and that again the diseased action, until the general health, and in some instances, the bones be seriously *infected.*" p. 203.

Thus, gentle reader, you have explained to you, the malignant nature of cancerous ulceration, by a man who is the avowed enemy of all men of genius or theoretical speculation!

But the goal of our analysis is in view, and we must give our readers as much of the useful matter as possible. As an application for correcting the peculiar fœtor of a cancerous sore, Dr. Rodman recommends it to be washed with tepid infusions of gentian, columba, or chamomile.

"A poultice of chamomile flowers, when properly stewed and softened, is peculiarly efficacious. The state of such a patient is greatly improved by drinking a sufficient quantity of port wine, and using a poultice of this kind at the same time. It should be made to surround the breast, and ought to be renewed every six or eight hours till the fœtor is subdued, washing the ulceration at each removal with some of the bitter infusions, by means of a syringe. During this, however, it is necessary to preserve an agreeable degree of bodily warmth, and to keep the bowels open." p. 206.

When the fœtor is subdued, the ulcerated surface may be covered with antiseptic powders, as cinchona, and several bitter roots, washing the parts as before. In this way, chalybeate powders may be used with advantage.

We have now exhibited the prominent traits of the work before us. We think Dr. Rodman has entirely failed in his elucidation of *cancer;* but that his work is extremely useful for the great body of general practitioners, as it will show them, that numerous indurations of the female breast, which have hitherto been considered as *schirrhi*, may be successfully treated, by a few simple remedies, without alarming themselves or their patients with the frightful name of Cancer.

Observations on the distinguishing Symptoms of three different Species of Pulmonary Consumption, the Catarrhal, the Apostematous, and the Tuberculous; with some Remarks on the Remedies and Regimen best fitted for the Prevention, Removal, or Alleviation of each Species. By ANDREW DUNCAN, Senior, M. D. &c. &c. 8vo. pp. 169. Edinburgh, 1813.

[From the London New Medical and Physical Journal, for October, November and December, 1814.]

LONG and gloomy is the catalogue of physical sufferings to which man, placed at an immeasurable distance above other animals, by his characteristic excellencies of material organization, and by the exclusive attributes of reason and intelligence, stands incessantly exposed:—heavy the tribute which, at the shrine of eternal and unerring justice, he is called upon to pay for this proud pre-eminence in the scale of created being. Civilization too, with all her charms and blandishments, introduces among her favoured children a train of evils and diseases, which are almost unknown to the more wild and rugged walks of savage life.

Amid the sufferings and the diseases which this catalogue exhibits to our view, pulmonary consumption stands inscribed in distinguished characters of terror and devastation. Fifty-five thousand victims are said to be swept off annually by it, from the soil of Britain. This is, we trust, an exaggerated statement. With the vulgar, every malady, of which extreme emaciation constitutes a striking feature, however different its origin and essence, is designated by one familiar and indiscriminate term. And medical men, we fear, too frequently cloak beneath that chilling and portentous name, "consumption," their own carelessness or inefficiency; and thus prematurely quench every hope still fondly cherished in the bosom of friendship and of affection.

Yet terrible—most terrible, not merely from their extent, but from their peculiar nature and severity, are the ravages committed by this relentless foe of human happiness and enjoyment. Her meagre and unsparing hand plucks not the hoary weeds, the fruitless thorns and brambles of our worldly wilder-

ness. The sensitive plant, the lily, the passion-flower, and the rose of human gentleness and excellence, are almost exclusively the objects of her rapacity. Upon the cheek, tinted with the warmest hues of youth, of beauty and intelligence; upon the eye, illumined by the fire of genius and sensibility; upon the heart, throbbing with benevolence, and animated by all the gentlest and most noble affections that can adorn or dignify the human character, this fiend of desolation delights to prey. Her very name conveys to the generous mind a sensation of chilliness and dread. Whenever that hopeless sound strikes upon our ear, scenes of woe and wretchedness, to which we have in past years been witness, flit across the darkened mirror of recollection;—the venerable form of age, bent in silent anguish over the faded, sinking wreck of all its earthly hopes and happiness;—ardent and impassioned manhood straining, with convulsive agony, to its widowed heart, the cold but yet lovely and interesting relics of plighted tenderness and truth;—unconscious infancy gazing with artless merriment upon the hectic cheek of its faint and gasping mother, or perhaps, drawing the seeds of future suffering and death from her shrunk and almost exhausted bosom. These are scenes which we can never turn to contemplate without emotion. Against the depressing influence of such recollections, long familiarity with spectacles of human misery, and the stern habits of retirement and criticism, have not yet sufficiently fortified our nature. A more than common gloom, inspired by such meditations, and by the acknowledged inefficacy of every attempt yet made by human science and industry, to oppose this desolating malady, hung over us, as we sat down to the perusal of the present work. Not even the reverend name of Duncan possessed a charm, sufficiently potent to dispel it.

To investigate with patience, and discriminate with accuracy, the various species and modifications of any given disease, are assuredly objects, than which, none more important can occupy the attention of medical observers. And where the modifications of such disease are found, as in pulmonary phthisis, to possess strongly-marked features of distinction, upon a a correct appreciation of which the knowledge of their origin and probable termination, and the decision of an appropriate plan of medical treatment, must be founded; this truth, in all

cases, most evidently applies with peculiar force. Thus viewed, the labours of Dr. Duncan come with no feeble claim to our respect and consideration. Striking differences of character, among those pulmonary diseases, classed, from the similarity of termination, under one common title, must, particularly in the incipient and more early stages, have obtruded themselves on the notice of every man, gifted with a common portion of discernment and penetration. Not a day, it is to be feared, passes, but many cases of phthisis, capable of great and even permanent relief by the well-directed resource of science, are abandoned as hopeless: some of which, terminating successfully from the unassisted energies of nature, serve only to deck, with unmerited honour, the nostrum of some vile empiric, and to degrade the regular physician in the eyes of the public.*

In corroboration of this remark, and as a specimen of the style and design of our author's publication, we transcribe a passage at length from his introduction; to some parts of

* We adduce, in support of this bold assertion, the following case; for the truth and accuracy of which, we pledge ourselves. A young woman, after suffering two months from pulmonary disease, was seized with purulent expectoration, and all the other symptoms of confirmed phthisis. Her case was considered hopeless by her medical attendants; and she was abandoned to the care of a very young and inexperienced man, with strict injunctions that nothing but occasional doses of opium should be administered. He found her, upon his first visit, lying upon her back in bed; her countenance pale and deathly; her eyes closed; her respiration short, and excessively laborious; her power of utterance gone. The body was covered with a clammy moisture; the pulse could no longer be felt. The inferior extremities were greatly distended by serous effusion. The poor girl was supposed to be dying. A jug, containing about one pint of nearly unmixed purulent matter, stood upon a table by the bedside. This attracted the attention of our young inquirer. He was told that the whole had been coughed, or rather vomited up, within two hours. He investigated minutely the history of the case. The girl had evidently been affected with chronic pneumonia. The inference was obvious. Such expectoration could only arise from extensive *vomica, not from tubercles.* A large vesicatory was applied to the sternum; heat to the extremities. A light cordial evidently recruited the nearly exhausted system. Opium and digitalis were administered, at regulated intervals; mild nutritious aliment directed to be frequently given, in small quantities. Under this plan, the state of the patient was hourly ameliorated. In three days, she sat up; in a week, quitted her chamber. Steel, alkalis, and bitters, completed her restoration. This happened several years since. We believe her to be still living in health.

which, sensible and judicious as we, upon the whole, consider it, strong and obvious objections, hereafter to be noticed, present themselves.

"The following remarks on that interesting subject, (phthisis) are the result of observations made with fidelity and attention for more than half a century. And if they shall enable future writers to improve the means of distinguishing the different modifications of pulmonary consumption from each other, they may be productive of some benefit to mankind: For by proper treatment, adapted to each particular modification from an early period of the disease, there can be no doubt that many valuable lives may be saved.

"By phthisis pulmonalis, or pulmonary consumption, is to be understood, that affection in which a general wasting or consumption of the body arises from a disease of the lungs. Among eminent writers, it has been a subject of dispute, whether phthisis pulmonalis can ever be considered as a proper idiopathic disease. By many, it has been regarded merely as symptomatic of other affections, particularly of hæmoptysis, catarrh, scrofula, pneumonia, and several other genera. But there can be no doubt, that it may justly be considered as an important genus by itself; and that it very frequently makes its approaches in such a gradual and imperceptible manner, as to be beyond the power of art, before it be certainly discovered to exist.

"In every instance of this affection, that modification of fever, which has been termed *hectic fever*, is very generally observed some time before a fatal conclusion takes place. And this fever principally, perhaps even solely, arises from the absorption of purulent matter, or rather from the absorption of a sanious or vitiated purulent matter, which produces in the human system effects much more deleterious than the absorption of mild pus, void of any peculiar fœtor or other strong sensible qualities. Such a sanious matter, however, when generated in the lungs, may be afforded from different causes. Hence, among those writers who have considered phthisis pulmonalis as a genus of disease, that genus has been divided into many different species. In the system of Sauvages, twenty species are enumerated under this genus. But from such minute divisions, no benefit, and much inconvenience arises.

Hectic fever, indeed, produced by purulent matter absorbed from the lungs, may arise from many different accidents, and many different diseases: And thus, it cannot be denied, that there is a foundation for many different species of phthisis. But after, in these cases, phthisis is induced, such species can neither be distinguished from each other by the symptoms, nor do they require a different mode of cure. A more simple view, therefore, of the divisions of this genus may be taken with advantage.

"In the division of any genus of disease into species, two great objects are to be had in view. The first and principal object is to point out such species as require a different mode of practice from each other. And the second object is to point out those species which can be distinguished from each other by obvious symptoms during the life of the patient. The distinction of species, which can be discovered only by dissection after death, serves merely to perplex and puzzle, without being of any material benefit. On this general ground, and with these objects in view, in phthisis pulmonalis, *three* different *species* may be pointed out, which may not only be distinguished by obvious symptoms during the life of the patient, but which also require some difference in that mode of treatment best fitted for the removal of each.

"These species may be distinguished by the titles of the *catarrhal*, the *apostematous*, and the *tuberculous* phthisis. The principal circumstance between these, requiring variety in the mode of treatment, is the difference in the source from whence the purulent matter is derived. In the first modification, it is merely separated from an inflamed surface, in a manner similar to the separation of pus from a blister-issue. In the second modification, it is furnished from an abscess of a considerable size, which may be formed in the cellular substance of the lungs, as well as of any other part of the human body. In the third, it is furnished from a tubercle, or from the parts surrounding a tubercle, terminating in suppuration; and commonly yielding, not proper purulent matter, but rather an ichorous sanies, somewhat resembling that which is often yielded by lymphatic glands, in cases of scrofula, when they terminate in suppuration. But the distinction of each of these modifications, during the life of the patient, can only be drawn

from an accurate account of the symptoms with which they are attended. And with that intention, a short history of each is subjoined.

"In every modification of phthisis, the symptoms may be referred to three heads: the pneumonic or pulmonary symptoms; the symptoms of hectic fever; and the supervening affections, or what may be termed the consequent symptoms. The morbid affections, however, referrible to the last two heads, are very much the same in all the species mentioned above; and it is always principally, often entirely, on the pulmonary symptoms, that the three species obviously differ from each other. In describing these affections, then, with a view to the diagnosis, it will be sufficient to give a separate account of the pneumonic symptoms occurring in each different modification of pulmonary consumption."

After the introductory Remarks upon Pulmonary Phthisis, Dr. Duncan proceeds to delineate the "pneumonic symptoms" occurring in each of the three species of this disease, to the consideration of which his work is exclusively devoted.

His first chapter is occupied by a description of the morbid phenomena exhibited in the incipient stage of "catarrhal phthisis." This is sufficiently minute and correct; but presents nothing peculiarly claiming attention or comment. At the close of this chapter, the ingenious experiments of the much-lamented Charles Darwin, to determine the chemical properties which distinguish pus and mucus, are noticed; and a summary of the conclusions to be drawn from them, accompanied by some comments of the doctor, is delivered. These we shall transcribe. They involve questions of high practical importance; and are not, perhaps, generally or accurately understood by the many, whose attention, absorbed in the ceaseless cares and labours of practice, is diverted from cultivating, or improving, an acquaintance with the arcana of experimental chemistry.

"1. Pus and mucus are both soluble in sulphuric acid, altho' in very different proportions, pus being by far least soluble.

"2. The addition of water to either of these solutions decomposes it. The mucus, thus separated, either swims on the top of the mixture or forms large flocculi suspended in it; whereas, the pus falls to the bottom, and forms, on agitation, an uniform turbid mixture.

"3. Pus is diffusible through diluted sulphuric acid, though mucus is not; and the same also occurs with water, or a solution of sea-salt.

"4. Nitrous acid dissolves both pus and mucus. Water added to the solution of pus, produces a precipitate, and the fluid above becomes clear and green; while water and the solution of mucus form a turbid dirty-coloured fluid.

"5. Alkaline lixivium dissolves, though sometimes with difficulty, mucus, and generally pus.

"6. Water precipitates pus from such a mixture, but does not precipitate mucus.

"7. Where alkaline lixivium does not disolve pus, it still distinguishes it from mucus, as it then prevents its diffusion through water.

"8. Coagulated lymph is neither soluble in concentrated nor diluted sulphuric acid.

"9. Water produces no change on a solution of serum in alkaline lixivium, until after long standing, and then only a very slight sediment appears.

"10. Corrosive sublimate coagulates mucus, but does not coagulate pus."*

"If these conclusions," our author observes, "be well founded, and hold at least generally, if not universally, it appears, that strong sulphuric acid and water, diluted sulphuric acid, and caustic alkaline lixivium and water, will serve to distinguish pus from mucus; that the sulphuric acid can distinguish it from coagulable lymph; and the alkaline lixivium from serum. When, therefore, any one entertains doubts about the composition of expectorated matter, let him dissolve it in sulphuric acid, and in caustic alkaline lixivium, or the aqua potassæ, as it is now styled in the Edinburgh Pharmacopœia. Let him then add pure water to both solutions. If there be a precipitation in

*Is it not extraordinary, that in the present improved state of animal chemistry, we have no correct account of the chemical composition of pus? Mucus, is reported by Brande, to consist of albumen and uncombined soda. Recent observations favour an opinion, that a conclusive diagnosis between pus and mucus might be drawn from an accurate examination of their *physical* properties. Dr. Young presents some highly valuable and interesting remarks upon this subject, in his late publication on "Medical Literature." They are transcribed at page 115 of the second volume of Dr. Thomson's "Annals of Philosophy."

each, he may be assured that some pus is present. But if there be a precipitation in neither, it is a certain test that the expectorated matter consists entirely of mucus."

We respect the opinions of the venerable Dr. Duncan. We deplore, in common with all others, to whom the interests of medical science are dear, the loss which that science sustained by the death of the estimable young man, whose early labours on this interesting department of animal chemistry we are now called upon to review. But truth yields with us to no secondary consideration: and we, with regret, state our conviction that these experiments, however scientifically or cautiously conducted, do not establish the distinction, beween the chemical properties of pus and mucus, in a manner so satisfactory and conclusive as our author seems to imagine. Upon the matter, expectorated from suppurating tubercles, experience leads us to assert, that the result of these trials is particularly ambiguous and equivocal. That experience too has engraven upon our mind a caution, the intimation of which may not be unprofitable to others, who, from an honourable solicitude to determine the character, and anticipate the termination, of any individual case, enter upon this attractive path of inquiry: Chemical tests, *of the utmost purity*, should be employed; or the inquirer will find himself involved in tenfold perplexities and error.

Verbal criticisms are commonly contemptible. We are decidedly averse from their employment; and never condescend to it, except when called upon to express our disapprobation of terms applied with obvious want of accuracy and precision, or calculated to convey erroneous notions respecting the nature of the object they are intended to designate. On these principles, we object to the term *catarrhal* phthisis, by which Doctor Duncan, throughout his work, denominates one of the three species of pulmonary consumption, upon which he treats.—The other two species receive their designation from the peculiar form of organic disease of the lungs, invariably discovered, upon dissection after death, to be co-existent and connected with them: while the catarrhal is named merely from an exciting cause. Is Doctor Duncan certain that catarrh, in all cases, decides the origin, and influences the development, of this modification of pulmonary disease? Is he not also aware

that catarrh may, and does frequently, operate as an exciting cause of the tuberculous and apostematous forms of the malady under consideration? We have seen both these species pass on to the suppurative stage, even under the eye of wary, vigilant, and scientific observers, without violence or peculiarity of feature, calculated to excite a suspicion that any disease, except obstinate catarrh, was committing depredations upon the system.* In these views of the subject, the term, catarrhal phthisis, is then obviously inadmissible. They, who have contemplated, and learned rightly to appreciate, the influence which language exerts upon the progress and improvement of the sciences, will not consider our remarks on this subject, as

* A short narrative of the ensuing somewhat singular case, will serve to illustrate this assertion. A fine and most interesting young man, on his return from a voyage to the East, was labouring, for some months, under obscure, but not very urgent symptoms of pulmonary disease. He had a short, dry, cough; dyspnœa; feeble, quick, and regular pulse. The general health long continued very little impaired; but emaciation of the body was, at length, visible. We visited him but once. Upon examining the parietes of the thorax, we were surprised to find no pulsation in its left region. The heart was beating *regularly upon the right side of the thorax, about the greatest convexity of the fifth rib.* He declared that, some few weeks previously, he had "felt his heart move, on a sudden, from the left to the right side of his chest." We gave it as our opinion, that the situation of this organ had been changed, either by a great dilatation of its pulmonary cavities, or by an enormous accumulation of pus in the left cavity of the thorax. Shortly afterwards, we learned that there was *a pointing of the integuments in one of the lower intercostal spaces of the left side.* This determined at once the nature of the case. A medical gentleman, of great celebrity, consulted at this time, declared the case to be *aneurism of the aorta!* Emaciation and debility went on progressively increasing. One day, in the midst of an unusual severe paroxysm of coughing, something gave way within his chest; the bronchiæ were filled with an overwhelming deluge of *purulent matter;* and the poor young man perished from suffocation. We remember to have read, in the diffuse and incorrect work of Mr. John Bell, on "Anatomy," some remarks upon a similar change of situation of the heart, from a collection of pus in the thoracic cavities.

In the "Traité de Splanchnologie" of Gavard, a Parisian anatomist of celebrity, we meet with an interesting passage respecting pulsation of the heart in the right side of the thorax. This curious phenomenon was observed in four persons of the same family; upon dissection of three of whom, who died, *the right or pulmonary cavities of the heart were found greatly dilated.* "Sur les trois autres," writes Gavard, "dont on avoit ouvert le cadavre, ou avoit trouvé *l'oreillette et le ventricule droits* (du cœur) *fort dilatés.*" We wish that the accurate work of Gavard, upon the anatomy of the various organs and viscera of the human body, were more generally known and read in these islands.

trifling, fastidious, or utterly unprofitable. To think correctly, and express ideas or convey instruction with clearness and precision, are auxiliaries more potent, more essential to the ultimate sucess of scientific investigation, than from a superficial view of the structure and operations of the human mind, we probably should be led to imagine.

Again, Is our author correct in the assertion, advanced in his Introduction, from which we have so largely quoted, that the "purulent matter," in catarrhal phthisis, "is merely separated from an inflamed surface, in a manner similar to the separation of pus from a blister-issue"? Perhaps, we do not accurately comprehend the term, *blister-issue;* but, if we really mean that, in the modification of the disease, designated by him catarrhal phthisis, the purulent secretion invariably, and *throughout the whole course* of such disease, takes place from the inflamed bronchial membrane, *without ulceration*, we have good ground to believe that he is mistaken. At all events, it may be considered a very questionable piece of doctrine; and such as, unless established by cautious and reiterated appeals to the scalpel, we can never consent to implicitly receive, even from the testimony of Doctor Duncan.

In the second chapter, "On the pneumonic symptoms occurring in the apostematous phthisis," Dr. Duncan appears, like other preceding writers upon this disease, to have fallen into important errors, and to have confounded two very distinctly-marked, and widely-differing, modifications of pulmonary consumption.

"One of the most frequent causes," observes our author, "from which an abscess in the chest derives its origin, is an hæmorrhage taking place from the lungs." Again, "In many instances, both active and passive hæmorrhage from the lungs, terminate in that species of inflammation which has been termed the suppurative; and this more frequently happens as a consequence of hæmorrhage from the lungs, than from any other part of the body." "Hæmoptysis, then, may justly be esteemed one of the chief causes, from which a large vomica or apostema in the lungs derives its origin."

Now, with all due respect for the elevated rank and character of the veteran professor, we candidly declare our opinion, that, in this train of argument, much incorrect observation and

unsound inference will, upon close inquiry, be detected. Suppuration does, indeed, sometimes succeed hæmorrhage from the lungs; but why? The answer, in our opinion, is obvious. Because that hæmorrhage, a process instituted by Nature, by the vital principle, or the vis medicatrix, as it has pleased some writers to designate it, has not been adequate to the purpose which it was designed to effect; not copious enough to completely remove that state of inflammatory action and congestion of the pulmonary organs, upon the uncontrolled progress of which suppuration must be inevitably consequent. We know not whether our meaning is expressed in terms sufficiently clear and intelligible.—To recapitulate. Inflammation of the respiratory organs, acute or chronic, takes place. Unless the concomitant increased action, and turgescence of the vessels, be speedily subdued, suppuration will, under circumstances favourable to its development, most probably ensue. To avert this impending danger, a process, salutary in its immediate effect, and less perilous in its remote consequences, is instituted by Nature. One of the loaded pulmonary vessels gives way; and hæmorrhage, to a certain extent, is the consequence. Now, this flow of blood is either adequate to the entire removal of the pulmonary affection, or it is not. In the latter case, the malady, after suffering an arrest of longer or shorter, often of momentary duration, hurries on with accelerated stride to its suppurative stage; and too commonly triumphs over all the vaunted resources of art. In the former, the result is various, and decided by circumstances, the influence of which our limited faculties can neither commonly discern nor correctly appreciate. Either the wound of the ruptured vessel may undergo the direct and fortunate process of reparation; may heal by what surgeons denominate the first intention; and the recovery of the patient be soon and firmly established: or ulceration, from the agency of unfavourable circumstances, may take place; and a species of phthisis, less intractable indeed by the resources of medicine, and less rapid in its progress to destruction, than the apostematous, become irrevocably confirmed. This modification, although, perhaps, as frequent of occurrence as the apostematous, and certainly, from our experience, more common, at least in South Britain, than the catarrhal form of pulmonary phthisis, is unnoticed by Dr. Duncan: and this

omission, assuredly, constitutes one of the prominent defects of his work.

From what has now been advanced, it will, we presume, appear obvious, that abscess of the lungs should not, indeed cannot, correctly be considered as the consequence of hæmoptysis. Vomica, in all cases where it has been preceded by pulmonary hæmorrhage, may, we believe, be more properly regarded as an effect of the uncontrolled agency and progress of that morbid state, for the removal of which the hæmorrhage has been instituted; but to the attainment of which object, whenever suppuration does take place, that hæmorrhage, either from its deficient quantity, or from some peculiar character or complication of the antagonist disease, has been utterly inadequate. We recollect rarely, if ever, to have seen copious hæmorrhage from the lungs, where pneumonia has terminated in suppuration. And, on the other hand, a vomica from idiopathic inflammation of the respiratory organs, we have more than once watched to its fatal termination, without any appearance of hæmoptysis, except those slight streaks of blood, issuing, probably, from a lesion of the minute vessels of the bronchial membrane; and almost immediately preceding the rupture of the parietes of the abscess, and the consequent effusion of its contents into the bronchial tubes.

Dr. Duncan, himself, in a somewhat indirect way, supports the train of reasoning, which we have thus boldly advanced, by an admission, that "hæmorrhage from the lungs, as well as from the nose, may sometimes be even salutary, *as removing a plethoric state.*"

Let us here pause for a moment, and apply to practice those reflections which a philosophic view of the phenomena and treatment of pneumonic inflammation is calculated to suggest. This digression from the direct road may not be without its uses. It may serve, in some degree, to support and illustrate the doctrines we have been attempting to establish.—A patient presents himself to the observation of his physician. He complains of fixed pain in the thoracic region; of hard, frequent cough, dry, or accompanied only by difficult or bloody expectoration. His respiration is distressed, and hurried; his constitution exhibits all the symptoms of the febrile state. What is the disease? Unequivocally, pneumonic inflammation!—What the

indications which offer themselves to the enlightened physician? Why, by a plan of depletion, and of abstinence from all sources of mental and bodily excitement, suited to the peculiar circumstances of the malady, he should attempt, not only to obviate the remote pernicious consequences, which must result from an unsubdued state of inflammation; but to render needless—to anticipate the salutary—but sometimes, from their excess, or from constitutional peculiarity of the patient, inordinate, or even dangerous exertions of the living principle, for the relief of the oppressed system. And with what certainty these objects may be accomplished by a vigorous adoption of depleting remedies, they, who reflect upon the energy and success of that medical practice, at present, commonly pursued in the treatment of acute diseases, throughout the British dominions, need not to be informed. Indeed, in such cases, where no morbid complication, no obscurity of symptoms exist, pathology and therapeutics may, in the hands of skilful and intrepid men, be brought nearly to the certainty and precision, which constitute the boast of mathematical science. We would recommend those, who invidiously, or from motives of interest, declaim against medicine as an useless and conjectural art, utterly destitute of any foundation upon the basis of truth or established principle, to ponder over these gratifying, and by no means infrequent occurrences in practice.

A description of the "pneumonic symptoms occurring in the tuberculous phthisis," is delivered in the third chapter. These symptoms are delineated with our author's accustomed fidelity; but on the long agitated question, whether the tubercles discovered in the persons, who have died of this modification of phthisis, be really organised, or merely inorganic substances; he, though evidently inclined to the former opinion, advances no conclusive reasoning or experiment. Perhaps, from its solution, no very obvious practical benefit would result. Yet, it must be allowed to constitute an interesting subject of inquiry.

We were speaking of that modification of phthisis, induced by rupture and consequent ulceration of a pulmonary vessel; and in the early stage of which, hæmoptysis forms the prominent feature. This is a species of the disease well known and described by medical writers, British and Continental. We mean not here that hæmoptysis, that scanty or irregular expec-

toration of blood which frequently is observed in the suppurative stage of apostematous, and still more frequently of tuberculous, phthisis; and which, we believe, proceeds from some pulmonary vessel, laid open in the extension of the ulcerative process. To that distinct form of disease we allude, in which an usually plethoric person, upon some powerful excitement of mind, some excessive bodily exertion, or soon after the development of an active pulmonary affection, is seized with hæmorrhage from the lungs; and where, from indisposition of the ruptured vessel to the healthy process of reparation, or from frequent recurrence of the hæmorrhage, ulceration and secretion of purulent matter become firmly established. We merely resume the subject, to remark, that in this species of pulmonary disease, this *phthisis hæmoptoica* of some nosologists, there exists a very distinct variety, characterised by peculiar and uncommon symptoms, which we do not remember to have been noted by any medical writer, of past or present times. From anxious and attentive observation of the few cases, which have hitherto fallen under our notice, we are led to infer, that the variety in question is dependent upon, or complicated with, some morbid change of structure in the pulmonary cavities of the heart, or in the great arterial trunk, arising from them; but we have not yet been able to obtain that satisfactory demonstration of its real character and essence, which dissection would probably afford. At some future period, we hope to claim a share of the public attention, to this new and unexplored track of pathologic research.

The 4th chapter of Dr. Duncan's Work is principally occupied with "Observations on the Hectic Fever attending the second stage" of pulmonary phthisis. His conjectures on the origin of this fever are without novelty; neither striking nor conclusive. A minute description of the hectic paroxysm follows; and the conditions of the pulse, of the appetite, and various excretory functions, pass successively under review.

Our author, in the ensuing chapter, details the morbid phenomena which arise in the "last stage" of pulmonary consumption; or, "what may be termed the supervening or consequent symptoms." Here we shall merely pause to observe, that except in cases of strongly-marked apostematous phthisis, we have seldom or never seen, upon the tongue and mem-

brane of the mouth and fauces, those aphthous spots degenerating into ill-conditioned ulcers, which the doctor represents as common to every form of the disease; nor can we accord with him in ascribing their production to the action of the expectorated matter upon the mouth. We are more inclined to consider it an adventitious symptom, decided by peculiar circumstances of the pulmonic's case or constitution; and dependent for its origin, on a *remote* sympathy with the morbid state of the bronchial membrane, or derangement of the alimentary canal.

But there is one symptom which frequently shows itself towards the fatal close of pulmonary phthisis; not noticed by Dr. Duncan, or, as far as our knowledge and recollection extend, by any other writer on this disease. The symptom to which we allude, is pain, affecting the integuments of the sacral extremity, somewhere in the vicinity of the internal malleolus; and probably implicating the minute branches of that division of the *anterior* crural nerve, destined to accompany the greater vena saphena. It is commonly abrupt in its accession, fixed, circumscribed, and intense; peculiar, if we mistake not, to the tuberculous form of pulmonary consumption. In one instance only have we seen it invading the centre of the gastrocnemius muscle. From its violence and intractability, it is alike distressing. We have never known it yield completely to the resources of medicine; it commonly declines as the shades of death deepen around the unhappy sufferer. Hot fomentations, and the vigorous topical and internal employment of opium, seem to exert a palliative but transient influence upon this tormenting symptom. It may, probably, be attributed, like many other inexplicable phenomena of disease, to some mysterious sympathy with the distant site of morbid operations, which the knife of dissection, and the brain of theory will, we presume, be equally inadequate to develop or explain.

The sixth chapter is devoted to a consideration " of the diagnosis in phthisis pulmonalis." After detailing in a very clear and masterly style, the principal symptoms which serve to distinguish pulmonary consumption from other diseases, with which it might possibly be confounded, and the three peculiar forms of that malady from each other, Doctor Duncan concludes thus:

"From due attention to those diagnostics which have now been pointed out, pulmonary consumption may be most readily distinguished from other diseases; and when it does occur, the three different species which have been pointed out may be more readily distinguished from each other."

Now this sentence looks well upon paper, and would, perhaps, have an imposing effect when delivered with due solemnity and deliberation from the professorial chair. Yet we entertain great doubt whether this facility of diagnosis in phthisical diseases, will not too often, phantom-like, disappear, when, at the bed-side of the dying pulmonic, an effort is made to grasp it. Experience tells us that it will. Did Dr. Duncan, ere that unguarded sentence escaped from his pen, recollect that, by the majority of sufferers from pulmonary maladies, the aid of medicine is seldom sought ere their first stage, that stage in which alone correct discrimination is commonly practicable, has reached its close? Ignorance, inattention, poverty, the occupations of busy—or the pleasures of fashionable life, in general, favour this fatal spirit of procrastination. Has a keen and veteran observer of the human character, like Dr. Duncan, need to be reminded that, in gleaning from a patient the history of early symptoms, the medical inquirer is often perplexed, or lamentably led astray, by the carelessness, stupidity, or affectations; by the whims or prejudices; by the studied and artful misrepresentations of the sick; or by the irreconcilable statements of anxious or interested relatives? Has he yet to be told of the countless shades and variations, which, from the influence of the pursuits and passions, of peculiar physical structure, of local circumstances and situation, phthisis, like all the other morbid affections of man's perishable organs, is, in any individual case, prone to assume?—Surely not.—Is he, lastly, not aware that two, perhaps even more, of the peculiar forms of organic lesion essentially connected with—and inducing—the various modifications of pulmonary phthisis, now under discussion, may exist in the lungs of an individual at the same time? Instances of this kind are scattered through the pathologic writings of past and present days. For one case, exactly in point, we refer our readers to the recent publication of Doctor Watt on chincough. Vomica, and tubercles in a state of suppuration, were seen existing in the

respiratory organs of a child, whose body was examined by that very zealous and enterprising man.*

If these observations have any foundation in truth, what then becomes of Dr. Duncan's facility of diagnosis? By a physician, enjoying his opportunities of instruction and research, and grown gray in the contemplation of diseases, this invaluable talent may, doubtless, have been acquired; but to the coarser perceptions of ordinary men, such happy powers of delicate and correct discrimination are, we well know, almost universally denied.

Upon this subject we pause, to comment with some earnestness; convinced that mischief, rather than good, must result from such statements, implicitly received and confided in.—What, we would ask, can be more likely to excite inquietude and disgust in the human mind, than a sense of inferiority to other men engaged in similar studies and pursuits? or, what calculated more effectually to awaken this painful and humiliating consciousness, than representations like that, upon which we now feel ourselves called to animadvert? Relying upon his powers of discrimination, which he has been told that it is a very easy business to acquire, the young and inexperienced physician hurries to the chamber of his patient; upon his anxious queries, a perplexing and contradictory "tale of symptoms" is unfolded: doubt and obscurity envelop the disease; the fair delusion vanishes; confusion and discouragement take possession of the inquirer's mind. From frequent repetition of his difficulties and discomfiture, he becomes timid and distrustful. First impressions are not easily obliterated: and he may lose, perhaps irrevocably, that self-possession and confidence essential to the physician's success. Nay, he may even quit in disgust, for some less sterile field of science, a path of study which his talents, properly directed on the onset, might have enabled him to explore with signal honour and reputation to himself, and benefit to his fellow-creatures. We have ever been led to consider—we have invariably found—the diagnosis of diseases a branch of practical medicine more difficult, and requiring, for its successful cultiva-

* See our critique on Dr. Watt's book, at page 169 of the 7th volume of this Journal.

tion, greater skill, and patience, and delicacy, than any other. In fine, the mind of man, in whatever path of science or labour it be engaged, will, we are persuaded, be only stimulated to more vigorous and steady exertion by a correct survey of the difficulties opposed to its progress; while, from an occurrence of unexpected obstacles, for which it has never been duly prepared, nothing but chagrin, indifference or disgust, can, sooner or later, be expected to accrue.

" Observations on the general plan of cure in pulmonary consumptions," form the subject of our author's seventh chapter.—Occupied here with the leading indications of cure, which present themselves in the apostematous form of pulmonary phthisis, Dr. Duncan remarks:

" In this species of phthisis then it must be evident, that a first and principal object is to discharge that purulent matter which is collected in the apostema. For accomplishing this, when the cyst remains entire, the first requisite is, that it should be ruptured; and for this purpose, measures may sometimes be advantageously employed by the physician; such, for example, as concussion of the system by the action of vomiting, of coughing, or the like."

On the soundness of this doctrine, or general expedience and advantages of the practical conduct which it is calculated to suggest, our minds, however, have not come to any decisive or satisfactory conclusion. The proximate cause of hectic fever, like that of the other phenomena exhibited by the living system in health and in disease, has hitherto baffled every effort of human genius for its discovery. Yet an opinion has gone abroad, and we are far from considering it destitute of plausibility, that this fever does not invariably or indiscriminately arise from the mere absorption of purulent matter into the system, but from its introduction only, when, from the influence of exposure to atmospheric air, or other unknown and inexplicable change, certain noxious qualities have been acquired by it.

Upon this intricate question, we presume not positively to decide. But, however it be, we have certainly seen large collections of pus deposited in the vicinity of the psoas muscle, or other parts of the body; and, after remaining a considerable time, eventually removed by the process of absorption, without inducing in the system the phenomena and ravages of hectic

fever: and in a case of abscess of the lungs, however considerable, we have reason to believe, that the peculiar and distinctive features of this morbid state are rarely or never developed, until purulent expectoration has been decidedly established. Complete absorption of pus from a large pulmonary abscess, the efforts of Nature, or resources of art, are, we apprehend, seldom adequate to accomplish; yet by the bare possibility of an occurrence, thus fortunate, we are surely warranted to regard the attempt to procure it as our *first indication* in the treatment of such disease. Preparations of quicksilver, foxglove, counter-irritation established in the vicinity of the purulent deposit, offer, perhaps, in this view, the fairest prospects of success. It should be recollected, that by the rupture of a vomica, even under circumstances the least inauspicious, a patient is unavoidably brought into a situation of pressing danger.

To the interesting subject of tuberculous phthisis, as connected with morbid enlargement of the mesenteric glands, not the slightest allusion is made by Dr. Duncan. This is surely an inexplicable omission; and may be justly pronounced to constitute another very striking defect in the outline and execution of his work.

That a morbid condition of the mesentery and the tubercular modification of pulmonary consumption are frequently complicated in the same individual; that the phenomena, peculiar to these forms of thoracic and abdominal disease, do clearly and conspicuously alternate with each other; are facts as firmly established on the basis of correct observation, as any with which the science of medicine is enriched. We need only watch with sedulous eye the varying features of tubercular consumption, to be convinced of the one; or examine the lungs and mesentery of a few deceased pulmonics, to obtain satisfactory demonstration of the other. Now, by some physicians of great experience, and high practical authority, it is contended, that the tubercular disease of the pulmonary organs is ever and invariably complicated with, and in fact, should be regarded as a consequence of, the mesenteric affection. These doctrines involve many and most important questions; we shall, therefore, pause for a while, to examine the validity of the ground on which they rest. In the first place we may remark, that disease of the mesenteric glands has frequently existed

long in its most dire and destructive form, where no disorder of the pulmonary organs was observed during life, nor the slightest deviation from their natural structure detected after death. Secondly, In the abdomen of subjects, who have perished from tubercular phthisis, alike severe and protracted, vestiges of morbid alteration have frequently been sought for in vain. For the accuracy of these assertions, we might appeal to many a long and lonely dissection, which the hand, now inditing them, has performed. How far they serve to invalidate the the correctness of the proposition by which they have been porvoked, it is needless to expose.

Again, in the phenomena of diseased action, as in all the operations displayed upon the great theatre of the universe, the link which connects the successive changes is generally so delicate, so difficult of detection by our coarse and imperfect organs, that we have no means of estimating with precision their mutual relations, or the influence which one must essentially exercise on the production of another. Nor, even where one change or one set of phenomena invariably succeeds another, is it necessary to infer that the last in order is dependent solely for its existence on that which precedes it; or, in other words, that they should be beheld in the absolute relation of cause and consequence. But we have shown, that disease of the mesentery, however long established, is not always followed by a tuberculated state of the lungs: and, on the other hand, that the pulmonary affection may assume its most aggravated and fatal aspect, without having been, in the slightest degree, preceded by the abdominal malady. The application of this reasoning to our argument is at once striking and correct; its hostility to the opinions we are assailing, equally obvious and decided.

Moreover, were tubercular phthisis, in all cases, dependent on a pre-existing state of mesenteric disease, the pulmonary affection should surely yield, if not wholly, at least in some degree, to the remedies which are employed with success to palliate or remove its cause. This, according to our experience, is not the case. A patient presents himself to us, in whom these forms of thoracic and abdominal disease are obviously complicated. We succeed, by the employment of the appropriate remedies, in relieving the pain, and tension, and irritation

characteristic of the latter; but the peculiar and more formidable features of the pulmonary affection are commonly, in a proportionate degree, aggravated. Palliate the latter, and the mesenteric symptoms will soon resume their original preponderance and intensity. How little does the remarkable propensity of these diseases to alternation bespeak the influence of those laws which are generally observed to regulate the operations of cause upon effect, and decide the obedience of the latter to the impulses of the former.

Lastly, it is certain, we repeat, that in many cases of tubercular consumption, mesenteric disease does exist, or has previously existed. But, perhaps, in all such cases, it will be most consonant to sound observation and correct reasoning, most useful in the views and decisions of practice, to behold them, not in the relation of cause and effect, but as the co-existing consequences of one common and yet unknown morbific agent. We cannot refrain from an expression of surprise, that to a man, possessing Dr. Duncan's field of inquiry and talent for discrimination, the experience of "more that half a century" should not have suggested some views, however faint or limited, of this striking and momentous connection between pulmonary and mesenteric diseases.

The eighth and concluding chapter presents our author's "Observations on particular practices employed in Phthisis Pulmonalis." These are extended to very considerable length; and our strictures have already so far transgressed the limits of ordinary criticism, that we must not allow ourselves to enter into any particular comments upon them. Among the more important remedies in this disease, he considers venesection; blisters and issues; emetics; refrigerants, as the vegetable acids and nitrate of potass; digitalis; milk diet; sea voyages; the bark of cinchona; vegetable balsams; myrrh; mercury; sarsaparilla; mezereon; tussilago farfara; lichen islandicus; conium; mineral water; and pneumatic medicines. Of all these he treats in succession: and the relative merits of each, and their correct applicability to peculiar circumstances of the disease, appear to us to have been appreciated and pointed out, by Dr. Duncan, with no common share of acuteness, accuracy, and candour.—He thinks favorably of the effect of inhaling the vapour of sulphuric ether, in which the dried leaves of conium maculatum

have been macerated; and recommends it as "particularly relieving the cough and dyspnœa and promoting expectoration." This we would particularly impress on the recollection of our readers. To palliate the pangs of human suffering, and soften the severer features of irritation and distress, form to the benevolent mind a grateful but melancholy office; and unhappily too often, in phthisical maladies, the only one which the physician can hope to undertake with success.

We perfectly coincide with Dr. Duncan in his opinion that counter-irritation may be more successfully employed against catarrhal, than any other form of pulmonary phthisis. But experience has taught us, that blisters, kept open only for a few days, are utterly inadequate to remove that ulceration of the bronchial membrane, upon which we believe the external phenomena of this modification of the disease to be essentially dependent. The process of purulent secretion should be permanently established from a large ulcerated surface, on the parietes of the thorax; and its operation may, we suspect, be greatly promoted by a full but cautious introduction of mercury into the pulmoniac's system. Catarrhal phthisis, it should seem, is the only species of pulmonary disease, in which, after purulent expectoration has been established, that powerful medicine, except in a very mild and alterative form, can be successfully, or even safely, prescribed.

Some valuable remarks on the regimen and exercise of phthisical sufferers, and on the best mode of palliating the more distressing symptoms by which they are harassed towards the close of the disease, terminate the chapter. We beg leave to recommend them to the attention of our readers.

From an Appendix, on the preparation of a soporific medicine from the common garden lettuce, which, it seems, is printed in the first volume of the Memoirs of the Caledonian Horticultural Society, we shall quote at considerable length. Dr. Duncan has prepared from this plant a narcotic, which he considers little inferior to opium in its soothing powers, and exempt from many inconveniences by which the exhibition of the valuable product of the poppy is frequently attended. This is an important communication. A knowledge of it cannot be too soon or too generally diffused, so that the Doctor's opinions respecting his *lactucarium* may be brought to the test of experiment.

"It has been the opinion of many, that all the milky juices spontaneously exuding from wounded vegetables, possess somewhat of the same sedative power with the milky juice of the poppy. Few plants in Britain afford such milky juice more copiously than the common garden lettuce, the *lactuca sativa* of Linnæus; and every one must have observed, that this juice, when spontaneously inspissated by the heat of the sun on the wounded plant, soon assumes the dark colour of opium, while at the same time it possesses in a high degree the peculiar, and I may say, specific taste which distinguishes that substance. And beside this, it is a well known fact, that lettuce was much used by the ancients as a soporific.

"These circumstances led me to turn my thoughts on some method of collecting and preparing this substance, that I might try its effects in the practice of medicine; and after several trials of different modes of preparation, what I shall now briefly describe are the best methods I have yet been able to discover.

"I dedicated to this experiment, in my garden at St. Leonard's Hill, near Edinburgh, a small bed of that variety of lettuce which is commonly known among gardeners by the name of *ice lettuce*. I allowed the plants, about a hundred in number, to shoot up till the top of the stem was about a foot above the surface of the ground. I then cut off about an inch from the top of each. The milky juice immediately began to rise above the wounded surface. Though then of a white appearance, it had next day formed a black or dark-coloured incrustation over the surface where the stem was cut off. I found it impossible to separate this by scraping, as is done with the milky juice exuding from the head of the poppy, when it has assumed the form of opium; I therefore cut off with a sharp knife a thin cross slice of the stem, to which the whole of the dark-coloured opium-like matter adhered. This was thrown into a wide mouthed phial, about half filled with weak spirit of wine, the *alcohol dilutum* of the *Edinburgh Pharmacopœia*, formed of equal parts of rectified spirit and water. By this menstruum, the whole black incrustation on the thin slice of the stalk was dissolved, and the spirit, as may be readily concluded, obtained both the colour and taste of the black incrustation.

"Each of my plants, in consequence of the fresh wound inflicted by the removal of the thin cross slice, afforded a fresh

incrustation every day. And by throwing these into the phial, I soon obtained what I concluded to be a saturated solution of the exudation from the lettuce, or rather of the milky juice in its inspissated state. It was then strained off, to separate the pure solution completely from the thin slices of the stalk. To this strained spirit, which had nearly both the appearance and taste of the ordinary *laudanum* of the shops, I have given the name of *solutio spirituosa succi spissati lactucæ.* From trials made with this solution, both on myself and others, I have no doubt that it is a powerful soporific. But to obtain a form, in which it might be exhibited with greater certainty as to the dose, I evaporated the spirit, and thus brought the residuum to a dry state. In this state, it has very much the appearance of the opium imported into Britain, particularly of that which is imported from Bengal, and which is a much softer substance than the Turkey opium. To this *opium-like* substance, I have given the name of *lactucarium;* and from some trials which I have made with it, when exhibited under the form of pills, it appears to me to be little inferior in soporific power to the opium which is brought from Bengal.

"From the *lactucarium* thus obtained, I have formed a tincture, by dissolving it to the extent of one ounce in twelve ounces of weak spirit, which is the proportion of the opium to the spirit, in the *liquid laudanum* of the Edinburgh College. To this formula I have given the name of *tinctura lactucarii.* I consider it the best formula I have yet been able to contrive for obtaining the soporific and sedative powers of the lactuca sativa; and in different cases I have, I think, seen manifest good effects from it, both as inducing sleep, allaying muscular action, and alleviating pain, the three great qualities of opium, which *demonstrate* it to be one of the most powerful sedatives. At present, however, I intend nothing more but to communicate to the Caledonian Horticultural Society, a method of preparing a soporific medicine from common lettuce. For ascertaining more fully its medicinal effects, I am at present engaged in a series of trials, which may, perhaps, be likewise communicated to them.

In perusing this publication, we have met with some opinions expressed by Dr. Duncan, which we cannot, without a mean dereliction of our principles and professions, suffer to

pass unnoticed. And against their promulgation from such a source, too prevalent as they already are among medical men, we solemnly and earnestly protest.

Towards the close of the eighth chapter, our author, speaking of the necessity of a due regulation of the passions, in subjects suffering from pulmonary disease, has this observation:— "At the same time, it is equally necessary to avoid what will depress the patient; *and even where there is very faint expectation of recovery, the chance of such an event will be diminished, by endeavouring to make the patient fully sensible of his own danger.*"

From Scotland, where religion, at least in its external forms, is established and observed with uncommon purity and strictness, and where, consequently, it may be hoped that infidelity has not yet shed, as among the children of the "more polished and enlightened south," her pestilential influence: from a man fast journeying, as Dr. Duncan must now be, to the "tomb of his fathers," we did not expect to hear doctrines like these openly disseminated. And we do hope that, should another edition of his work be called for, he will so far humour the "absurd prejudices" of us infatuated reviewers, as to alter or expunge this obnoxious passage.

By some, whose eye may glance over our perishable page, it will perhaps be thought, that the opinions of the venerable writer before us, have been criticized with a freedom and asperity ill-suited to his years, his character, and situation; and that, neglecting the peculiar excellencies of his work, we have confined ourselves to the invidious task of raking up, and exposing, real or imaginary errors. To these accusations, if such be preferred against us, our reply is brief, we trust, demonstrative of their futility: Criticism respects not the distinctions of rank, or title, or reputation; truth is the object of her researches. Anxious in its pursuit, she regards, with indifference or contempt, every minor consideration, which may arise upon her stern and rugged path. Again, the real excellencies of the productions of art, as those of nature's boundless domain, shine with a native and intrinsic lustre. Obtrusive on every passing eye, little hesitation or sagacity is requisite to descry them. Eulogy heightens not their value, nor can ignorance and prejudice permanently sully or obscure it. But to detect error under

its most specious disguise; to separate it from the sterling gold of truth; to strip from its surface the tinsel gloss, with which, by the alchemic touch of genius, by the influence of character, or the graces of a polished and commanding style, it may have been invested, is a delicate and laborious process; requiring, for its successful execution, all the concentrated powers of the human mind. For this department of science, criticism was instituted. Upon her hand this arduous process devolves; and, by its results, the merits and utility of her individual labours must be eventually determined. Lastly, we deem it an imperious duty to examine, with redoubled rigor and circumspection, doctrines promulgated by the aged or eminent of our art. Error, stamped with the name and authority of a Duncan, must prove, in its consequences, peculiarly pernicious; because every where received and propagated with peculiar confidence and celerity.

Viewed in one light, this little volume may convey an instructive lesson, *pregnant to the diffident yet aspiring heart with consolation and encouragement.* To charm by the splendour, to strike with the novelty, or astonish by the magnificence of its views, are the exclusive attributes of genius; but how successfully a mind of even common powers and cultivation may, under proper impulse and direction, be exerted; how essentially contribute to the honour and interests of any science, upon which its energies are employed, the perusal of these pages will incontestably demonstrate.

In fact, we know not whether in a science, like that of medicine, which admits only of being improved by the slow processes of rigid observation and of cautious induction from facts, genius, impatient of toil, and soaring above restraint, be pre-eminently calculated to excel. An appeal to the historic records of that science, will justify inferences decidedly opposite. To men possessing patience, industry, unwearied application, invincible firmness, and all the more solid and sterling qualities of the human mind—qualities rarely implanted in the fervid and volatile bosom of genius; to a Bonetus, a Morgagni, a Lieutaud, and a Baillie, medicine is principally indebted for her present state of culture and exaltation: and certain it is, that one faithfully recorded history of disease, illustrated by minute dissection, is, when poised in the scale of practical

utility, worth a bulky quarto of ingenious speculation, decorated with all the dazzling but evanescent splendours of a Darwin's intellect.

And we, while kings, and statesmen, and conquerors, attract the gaze and the acclamations of an admiring multitude, gladly turn aside from the passing pageant, to contemplate human excellence in its purer, though less splendid and imposing garb; and offer our feeble tribute of veneration to the man, who, after a long life honourably devoted to the culture of a beneficent art, shall descend to his grave (and far from that grave be the venerable Dr. Duncan yet removed), amid the lamentations of that science, and the benedictions and regret of that community, which he has so signally benefited and adorned.

BIOGRAPHY.

Biographical Memoir of the late Henry Reeve, M. D. F. R. S. of Norwich.

[From the Edinburgh Medical and Surgical Journal, for April, 1815.]

It would be an act of injustice to the memory of our late estimable friend and colleague, were we to permit another number of this journal to appear, unaccompanied by some memorial of his talents and worth, some public testimony of our sincere and deep regret for his premature loss. In attempting to detail the incidents of his short but active life, we shall probably, indeed, incur the imputation of standing forward as the partial eulogists, rather than as the unbiassed biographers of our friend. But we know not how to avoid such an imputation, where simple description will be construed into eulogy. To review the career of those individuals, whose moral excellence and intellectual endowments have been conspicuous in every situation in which they were placed, tends to elevate our views of the human character; and the task, though melancholy, cannot be devoid of interest and improvement.

Henry Reeve was born, in the year 1780, at Hadleigh, in Suffolk, in the vicinity of which his father is in possession of considerable property. After having received the usual preliminary instruction, he was sent, at the age of nine, to a school of great reputation at Dedham, in Essex, under the care of Dr. Grimwood, where he entered for the first time upon the study of Latin. Possessing an excellent memory, and uniting great diligence with quickness of apprehension, he made an uniform and rapid progress in this new department of study, and out-stripped most of his contemporaries in his classical acquirements; nevertheless, though his acknowledged superiority necessarily raised him to the favour of the master, yet his affability and benevolence, so characteristic of his disposition in after-life, averted all envy, and secured him the esteem and attachment of his school-fellows. Many an exercise, indeed, was shown up by the indolent or less expert boys, which he had penned in addition to his own. Yet with these habits

of industry, he united great activity in the ordinary exercises of school-boys, was distinguished as a cricket-player, and took the lead in some other active pursuits. On one occasion, especially, when an alarm reached the school-room, that a boy had fallen into the river, and was in danger of being drowned, Reeve was the first to reach the brink, and to plunge, at the hazard of his own life, to the rescue of his school-fellow. The confidence which his worthy preceptor placed in the steadiness and humanity of young Reeve, induced him to place under his immediate care an only child, of delicate habit, who was sent to Dedham, at a very early age, and who found a kind protector, as well as a tutor, in his new friend. The success with which Reeve cultivated classical literature, and especially the Latin language, was very considerable, for he subsequently wrote that language with fluency and elegance; of which his thesis, and especially his dedication to Mr. Martineau, affords abundant evidence; the point and neatness of the expression in the latter, as well as the sentiments which it contains, were, indeed, highly creditable to his taste and feeling. In addition to his love of the classics, he evinced, while at school, much of that disposition to the examination of natural objects, and to the pursuits of agriculture, which subsequently occupied his attention; and he was sometimes found by his school-fellows when at their play, employing himself in the dissection of a bird or a mouse.

This propensity to the investigation of nature, probably determined his choice of the medical profession; and, on quitting school in the year 1796, he was placed with Mr. Martineau, a surgeon of great ability and reputation, at Norwich. Under such a preceptor, who ever retained his warmest esteem and attachment, his assiduity, his zealous spirit of inquiry, and his facility in the acquisition of the objects of his pursuit, could not fail to procure for him a store of fundamental knowledge in his profession, which the earlier studies of the art rarely afford. Accordingly, after passing four years in circumstances thus favourable to his improvement, he went to the university of Edinburgh, in the autumn of 1800, much farther advanced in medical and surgical knowledge, and better prepared to profit by the course of academical studies, which he was about to commence, than the generality of students who repair thither.

During the three years, which are required by the statutes of the university, to be dedicated to study by those who graduate there, he was assiduous in his attendance on the different lectures appertaining to his profession, and was led, by his general love of science, to extend his exertions in this way beyond the bounds prescribed by the university to the students of medicine. Thus, in his first year, he attended the valuable course on Natural Philosophy, delivered by professor Robinson; in his second, the interesting and eloquent course of professor Dugald Stewart, on the subject of Ethics; and, in his third year, he not only became a pupil of Dr. Barclay, for the sake of more minute anatomical research than the college then afforded, and of Mr. Allen, whose able and elegant course on the subject of Animal Economy was the select resort of the most ingenious and zealous among the students;—but he also attended, with great assiduity, the lectures of professor Coventry, on Agriculture and Rural Economy.

Within the pale of the college, no distinctions are conferred to stimulate industry or to reward merit. The individual who can barely struggle through the ordeal of his final examinations, and he who passes the most rigorous trial with facility, and with an exuberant display of knowledge, equally receive the common degree. Nevertheless, there are, annexed to the system of education at Edinburgh, sources of distinction, and therefore of emulation, not the less calculated to call forth the energies of the students, because they originate and exist exclusively among themselves. In the societies, at which the most respectable of the students meet weekly, for the discussion of scientific topics, the zeal and industry of the members are excited, not only by the prospect of reputation, in consequence of the display of extensive information and ingenuity in the debates, but by the hope of attaining the power and dignities of office, especially of the presidential chair, which are conferred annually on four of the most distinguished members, by their own free ballot. The value, which is attached to these truly honourable stations, may be estimated by the constant exhibition of the titles in the front of the inaugural dissertations. Mr. Reeve having joined the Royal Medical Society, entered at once into the discussions which were carrying on, displaying an intelligence and facility of elocution, unusual in so

young a member, and in one unaccustomed to speak in a public assembly. The modesty and mildness of his demeanour, his knowledge of the subject, and the flashes of humour with which he enlivened the gravity of debate, contributed also to obtain for him the early esteem of the members; and in the following year, the second only of his residence at Edinburgh, he was elected to a seat in the presidential chair,—an honour seldom obtained before the third year. He was also elected to the same honourable office, the following year, in a smaller society instituted for the investigation of natural history. His attachment to free discussion, induced him also to become a member of the "Speculative Society," established in the college for the cultivation of eloquence,—a society in which many of the rising ornaments of the senate and of the bar at that time exercised their early talents.

In June, 1803, he terminated his active and honourable career at Edinburgh, by taking the degree of doctor of physic; on which occasion he evinced his continued inclination to the study of natural phenomena, by selecting for the subject of his inaugural thesis, the nature and causes of the torpidity of hybernating animals. The title of his essay was "Disputatio inaug. de Animalibus Hyeme Sopitis." We have already alluded to the peculiar neatness of the Latinity, with which his facilities of composition in that language enabled him to clothe this dissertation; and to the good taste and honourable feeling exhibited in the dedication to his much esteemed preceptor, Mr. Martineau. Of the contents of this essay, as he subsequently republished it in another form, we shall have occasion to speak hereafter.

Having quitted Edinburgh, Dr. Reeve spent the greater part of the two ensuing winters and of the year 1804 in London, for the purpose of extending his professional knowledge, both by learning the opinions of different practitioners, in a new field of inquiry, and by multiplying his own observations among the multitude of maladies, which the various population, and the central attraction of the metropolis, necessarily bring under view. Here he became a diligent attendant on a large hospital, and also on some of the lectures delivered by eminent teachers. He was likewise admitted a member of the Medical Society of London, which holds its meetings in Bolt

Court, Fleet Street, and which was at that time the only society in the metropolis, in which the opinions of any of the established practitioners could be heard. He attended its weekly meetings, and, as was his custom, entered actively into the interchange of information, which it was the object of the institution to promote. During this year, while he was half determined to fix his residence in London, he had meditated, together with one of his fellow students, settled in the metropolis, on the want of a good periodical journal, which, by appearing quarterly, might command a sufficient quantity of valuable materials, to be more uniformly interesting than the only monthly medical journal then existing; and Dr. Reeve had himself drawn up a *prospectus* of this projected work. At the same moment, however, Dr. Duncan, junior, had formed the design of the Edinburgh Medical and Surgical Journal, upon the same plan, and had taken some steps for its commencement; but, having heard of the intention of his two friends, he communicated his proceedings to them, and suggested the mutual advantages which might result from uniting their labours,—a proposal to which the latter immediately acceded. Dr. Reeve continued, as long as his health permitted the exertion, to give his valuable aid, in various communications, to which we shall have occasion to allude, as well as in the supply of a considerable share of the anonymous criticism.

During his residence at Edinburgh, Dr. Reeve had formed a most intimate friendship with Mr. now Dr. De Roches, a fellow-student from Geneva, of an amiable disposition and considerable talents, who, after his graduation, also continued his medical studies in London. This gentleman being about to return home, in the spring of 1805, Dr. Reeve determined to accompany him, for the purpose of visiting as many of the interesting countries of the continent, as were not rendered inaccessible by the occupation of the French armies. They embarked at Harwich, and having landed at Husum, were compelled, by the presence of the French in the Electorate of Hanover, to go northward, by Lubec, to Magdeburg, whence they travelled through Halle, Leipsic, Weimar, Frankfort, &c. into Switzerland. In the three first places they spent some time, examining the anatomical museum of Loder, and visiting professors Reil, Sprengel, Gilbert, Kuhn, and other learned

men. In about six weeks they reached Neufchatel, which, being then under the protection of the king of Prussia, afforded a safe asylum to an English traveller. Here Dr. Reeve remained two months alone, with the view of perfecting himself in the French language, and his friend proceeded to Geneva. Here he seems, in consequence of his solitude in a foreign country, to have had a slight degree of the *maladie du pays*, and to have suffered, perhaps for the only time in his life, a considerable depression of spirits; for on his return, at the expiration of two months, Dr. De Roches found him pale and thin, and disposed to avoid society and cheerful occupations. The company of his friend, and the commencement of a tour, speedily restored him to his usual hilarity and health. They visited Berne together, and examined its hospitals, of which Dr. Reeve published an account in the fifth volume of this Journal.* He was much delighted with a national festival, in one of the most romantic spots of Switzerland, near Interlacken, which was called the *Fête des Bergers*, and at which all the athletic feats of the Swiss peasantry became the subjects of contests and prizes. From thence, under the protection of a little pardonable *ruse de guerre*, he ventured to accompany his friend to Geneva, as an American. His stay, however, was necessarily short, and with much regret on the part of Dr. De Roches and his family, they once more separated. Dr. Reeve now hastened, in consequence of the advancing season, to the glaciers of Chamouny, and thence passed through many interesting scenes in the Valais and petits cantons, by Zurich, Baden, and Basle, to Schaffhausen; whence he proceeded by Munich to Ratisbon, where he embarked upon the Danube, and made the voyage to Vienna.

During this part of his journey in Switzerland, his attention was attracted to the celebrated baths of Leuk, in the Valais, and he published, through the medium of this Journal,† an interesting account of the springs which supply them, and of the surrounding country; describing also the temperature of the baths, the mode of bathing, and the effects of the operation, as well as the diseases which are said to be remedied by resort-

* Edinburgh Medical and Surgical Journal, Vol. V. p. 253.

† Vol. III. p. 150.

ing thither. In the course of the same journey, his inquiries were directed to the nature of that singular condition of the human economy, which characterizes the Cretins; and he obtained drawings of the skull of one of these unfortunate beings, which he brought to England, and laid before the Royal Society, accompanied by a brief memoir on the subject.* He likewise contributed to this Journal an interesting communication on the same subject, under the title of "Some Account of Cretinism," which was illustrated by two sketches of the skull.† He ascertained that there is no necessary connection between the *goitre*, or tumour of the thyroid gland, and Cretinism; nor between either of these diseases and the use of snow-water: but he was disposed to ascribe the disease of the Cretin to the same causes, to which a somewhat analogous malady, the rickets, appears to have owed its origin in this country; namely, bad air, unwholesome food, want of cleanliness, &c.

On reaching Vienna, he determined, in consequence of the disturbed state of the Continent, to make that metropolis his place of residence for the winter. This determination, however, compelled him to break an engagment, into which he had entered previous to his departure from London. During his short stay there, his zeal and information had become so far the object of notoriety, that he was solicited to deliver a course of lectures at the Royal Institution, "on the moral and physical history of man;" and his name was actually announced by the committee among the lecturers of that year.

His residence at Vienna, during the winter of 1805, was the source of much interest; as he not only obtained an extensive introduction to various persons of rank and eminence, but remained there during the occupation of that metropolis by the French, after the defeat of General Mack, and had frequent intercourse with the medical and other officers of the French army. The German language was a leading object of his attention while at Vienna, and he cultivated it with considerable success. A knowledge of this language indeed has become highly important to the medical philosopher, since it has been enriched by the writings of Blumenbach, Reil, Richter, Spren-

* See Philosophical Transactions, Vol.

† See Edinburgh Medical and Surgical Journal, Vol. V. p. 31.

gel, and many other able physiologists and physicians. He likewise availed himself of the opportunity, which a winter at Vienna presented, of prosecuting his researches in regard to the phenomena of torpidity: and for this purpose he kept several marmots, and a hamster, at his lodgings, carefully investigating the state and changes of the functions in these hybernating animals. Several communications to the newly established Edinburgh Medical and Surgical Journal were the result of his observations at Vienna; particularly, an account of the state of Vaccination on the Continent, including a statement drawn up at his request by Dr. De Carro;*—two papers, descriptive of the general hospital, and the school of medicine at Vienna;†—and an "Inquirer," respecting the then state of medical science in Germany.‡

Dr. Reeve quitted Vienna early in the spring of 1806, and visited Prague, Dresden, and several other cities, which offered objects worthy of attention. At Berlin he remained for some time, having been introduced to the principal literati and other persons of distinction, and embraced the opportunities, which were afforded him, of examining the state of medicine and science in that metropolis. The result of this investigation was briefly detailed in the Edinburgh Journal, together with a list of the diseases which had occurred in the great hospital there, for the space of four years.§ Still obliged by the state of continental affairs to pursue a northern course, he went from Berlin to Hamburgh, and thence to Cruxhaven, where he embarked for England.

For some time after his return, Dr. Reeve was undecided as to the place where he should finally settle to practise his profession, balancing especially between London and Norwich. The metropolis, as the great centre of learning, science and wealth, presents many attractions to a professional man of liberal education. It opens before him a wide field for honourable ambition; it abounds with intelligent and polished society; and its very magnitude deprives professional competition of all its personal jealousy and enmity. The road to practice, therefore,

* Vol II. p. 126. † Ibid, p. 491, and Vol. III. p. 122. ‡ Vol. IV. p. 69.
§ See Some Account of the Medical Topography of Berlin, Vol. II. p. 376.

appears to be both broad and smooth, in comparison with provincial situations. But having weighed, on the other hand, the extreme uncertainty of ultimate success, and the necessarily long period which must elapse, before any considerable reputation or emolument can be obtained in London; and placing also in the balance the many highly valued friendships which he had formed at Norwich, the probability of more speedy advancement into practice in that smaller circle, and the more substantial happiness of domestic society, and of that intimate intercourse with a smaller number of real friends, which a provincial residence affords, he decided upon settling at Norwich. Accordingly, in the autumn of this year, 1806, he went to reside in that city. There was another circumstance, indeed, from which also he promised himself more essential happiness than from the splendour of metropolitan reputation or wealth, namely, the completion of an early engagement with a young lady, every way worthy of his attachment, and, in fact, remarkably resembling himself, in the possession of abilities and of solid attainments above the usual acquirements of her sex, as well as in the unaffected cheerfulness, candour, and benevolence of her disposition. This prospect was fully realized, and he ever rejoiced in the determination which fixed him at Norwich. He was married to Miss Taylor in 1807.

Although the medical practice at Norwich was greatly preoccupied, especially by Dr. Lubbock, and by two or three distinguished surgeons, yet the value of Dr. Reeve was speedily recognized by the public, and he was almost immediately appointed physician to the Public Dispensary, on the resignation of Dr. Lubbock; and, on the occasion of the death of that much respected friend, in the year 1808, he was appointed his successor in the offices of physician to the Norfolk and Norwich hospital, and to the Bethel.

In the year 1809, Dr. Reeve committed to the press his only literary work, (his thesis, and the various papers mentioned in this memoir excepted) which was entitled, "An Essay on the Torpidity of Animals." He had pledged himself, at the conclusion of his inaugural thesis, in 1803, to prosecute the subject farther; and this essay comprises a considerable addition of information, both original and collected, to that which the thesis

contained. The third and fourth sections especially, which treat of "the variety of temperature in different classes of animals," with "general remarks on torpidity, on sleep, and on the application of cold in diseases," are replete with curious and interesting observations. It is clearly established, that cold, and want of food, are the principal remote causes of torpidity; but the principal question, by what means certain animals, with a double heart and circulation, are capable of existing, without any respiration, for a considerable period, and yet are recoverable, remains to be determined. The sources of animal temperature are not yet satisfactorily developed. Dr. Reeve has reasoned upon the subject acutely; but the subject itself is imperfectly understood, because we are not yet in possession of a sufficient collection of facts from which to deduce any ultimate inference. In October of the same year, on the return of the sick troops from Walcheren, Dr. Reeve was appointed temporary physician to the military hospital at Norwich. He was diligent in the investigation of the diseases which came under his care, and kept an accurate register of their appearances, and of the treatment which he pursued.

Not content with the bare performance of the duties required by his official situations, he kindly undertook to promote the progress of some young students connected with the hospital, by communicating to them, at stated periods, at his own house, his opinions on the subject of physiology; and subsequently, in the year 1811, he delivered a course of public lectures on the same subject. This course extended to twenty-five lectures, three of which were given weekly, according to the following plan:—Commencing with a sketch of the natural history of man, the lecturer proceeded to describe the characteristics of animal life, the nature of the muscular fibre, and the phenomena of muscular irritability, and pointed out the analogies and differences between the vegetable and animal world, and between man and the other animals. He then treated of the structure and functions of the brain, and of the distribution and influence of the nervous system; of the faculties and instincts of man and brutes; of the varieties of the organs of sense and motion; and of the senses of sight, hearing, touch, taste and smell, respectively; with incidental observations on ocular spectra, on the deaf and dumb, on the sympathies of

different parts, &c. Then followed disquisitions on the vital functions, circulation and respiration, and on digestion, secretion, absorption, and excretion; on animal temperature, and the influence of heat and cold; on the hybernation of animals, and on sleep: and the course was concluded with a view of the growth and gradual decay of the animal body, and of the means of restoration and reproduction; with remarks on population and longevity, on the means of preserving health and prolonging life, and on drunkenness, the temperaments, passions, and antipathies. These lectures were illustrated by various drawings and preparations, which contributed, with the simplicity and perspicuity of the language in which they were delivered, to interest the attention of his audience and to render a technical subject intelligible and agreeable.

The zeal and activity of Dr. Reeve were not, however, limited to professional pursuits. The same spirit of diligence and alertness manifested itself in all the concerns of life. Whenever any measure of public or private utility was proposed, his ardent mind entered quickly and steadily into the project, and his time and means were devoted to its accomplishment; particularly when the amelioration of the condition of the poor and ignorant was the leading object. While resident in London, his attention had been excited by the establishment of the system of general education, proposed by Lancaster; and in the course of his travels in Switzerland, he was delighted to meet with a similar institution at Iverdun, (so admirably described by Mad. de Stael,) and to have the opportunity of becoming acquainted with its benevolent and enlightened founder, with whom he entered into a minute examination of its plan. Being thus strongly impressed with the practicability of the design, and confident of the extensive benefits likely to result from enlightening the minds of the lower orders of mankind, Dr. Reeve was among the first to promote the establishment of a school at Norwich, upon the liberal plan of inviting the children of the poor, of all denominations of religion, to partake of the blessing of knowledge; maintaining, that it would be equally unjustifiable to refuse the benefit of education to the members of any sect, or to the advocates of any peculiar catechism, as it would be in him to limit his professional assistance to persons who held a particular

creed. His activity and personal exertion contributed materially to the establishment and success of this school; for at his house the preparatory meetings of the committee, which organized the institution, were held; and he voluntarily undertook a *census* of the infantine poor in his own district.

The same indefatigable zeal was greatly instrumental in promoting the formation and prosperity of a philosophical society at Norwich. If he did not actually found that establishment, he chiefly contributed to clear away the obstacles which opposed its foundation, and to harmonize and bring together the various combination of age, rank, talent, and taste, in the common cause of philosophical inquiry; and the little code of laws, by which its proceedings were regulated, was principally his work. His regular attendance at its meetings, the alacrity with which he entered into the discussions, the fluent simplicity of his elocution, and the various information which he brought forth, on the different subjects introduced to the society, contributed to the utility and success of the institution.

Thus constantly engaged in the active promotion of every useful and benevolent, object Dr. Reeve was at the same time rising steadily in professional reputation; and he had the satisfaction of finding not only that his practice and its emoluments were increasing, but that his skill, assiduity, and kind attention, were highly valued by those who received his aid. In the midst, however, of these gratifying prospects, secure of the ultimate rewards of his talents and acquirements, assured of the permanent confidence and attachment of his fellow-citizens, and happy, as one unusually capable of happiness, in the little domestic circle rising around him, as well as in the intercourse of a few intelligent and esteemed friends, he found his activity and his enjoyments gradually threatened by the symptoms of a slow disease. This insidious indisposition commenced about the end of the year 1811 or the beginning of 1812, and was observed with some alarm by his friends: but he still continued his usual pursuits; and it was not till the month of May, 1813, that he first mentioned the disease, in the course of a regular correspondence with the writer of this memoir. He then described it as a bad state of habit, or one of those conditions of the constitution treated by Mr. Abernethy among the "disorders of health." It was characterized by indigestion, weakness,

and local pains, which appeared to be sometimes muscular, and sometimes, he thought, in the nerves and bones; by swellings in the lymphatic glands, and an enlargement of the bone of the right arm. At this time he trusted that exercise on horseback, country air, the shower-bath, and a nutritious diet, with an occasional alterative or laxative, (though the bowels had never been out of order,) would restore him in a little time to health. And during the summer of 1813 a considerable amendment was in fact produced; but he still suffered from a succession of tumours, which were tedious in suppuration, and slow in healing; and in the course of the winter the malady seemed to be again aggravated. In the following spring, the left knee was seized with pain and swelling, which occasioned so much lameness, as to render walking almost impracticable, and to prevent any communication with his patients except in a carriage; and even that was accomplished with pain and difficulty. In this state of lameness, with two puffy tumours on the scalp, and with a considerable loss of flesh and strength, he determined to quit Norwich and his profession for a time, in search of health; and, having first consulted several of his brethren in London, he resorted to the coast of Sussex, in the beginning of June 1814. In addition to the lameness of the knee, and to the glandular swellings and tumours of the scalp, which were multiplying and increasing, he had for two or three weeks felt some difficulty of respiration, with a sense of obstruction and huskiness in the larynx, as if from catarrhal inflammation, which also affected the voice. He found his general health improve, and his pains diminish, during his stay at Worthing, by the use of the warm sea-bath, and by the application of a blister and some other local expedients to the knee: but the wheezing increased, and the voice was nearly lost, especially in the mornings. About the 20th of July, indeed, this affection of the trachea became considerably aggravated; the difficulty of breathing increased, and a violent cough now ensued, with a discharge of mucus, sometimes tinged with blood. Hence he was induced to quit the sea-side, and proceed to Bath. On his arrival at Bath, on the 1st of August, he found the complaint in the wind-pipe less troublesome; but the swelling of the knee was not diminished; it was painful and hot, with an apparent increase of fluid in the cavity of the joint, while the leg was

cold and œdematous. Under the direction of Dr. Parry, who paid him the most friendly attention, eight leeches were applied to the knee, and afterwards some refrigerant lotions; and he took saline effervescing draughts with squills, and adopted an antiphlogistic regimen. The affection of the trachea somewhat abated, and the voice improved. One of the tumours of the scalp was opened by the knife, and discharged an albuminous fluid, with a good deal of blood, from a wounded twig of the temporal artery; the discharge continued free, and several ounces of blood were lost by a second hemorrhage. Diarrhœa now came on, and an erythematous inflammation attacked the left ear; and both these symptoms continued several days. The muscular pains were relieved; but the tongue became white, and the appetite failed. The knee becoming hot and painful, was again bled with twelve leeches; but these symptoms were not relieved, though the swelling and tension were somewhat diminished: and more decided fever ensued. Leeches were also applied to the vicinity of the trachea; and opium and James's powder were taken with a view to the relief of the dyspnœa and wheezing, which assumed somewhat more severity in the morning paroxysms, putting on occasionally the appearance of spasmodic asthma. The febrile symptoms were somewhat abated, when, on the 2d of September, Dr. Reeve set off on an easy journey to his father's house at Hadleigh, and passed a few days at Mr. Martineau's house, near Islington, for the purpose of rest, and of seeing some of his medical friends in London. He arrived at Hadleigh on the 16th of September. The inflammation of the wind-pipe was now obviously increased, producing much irritation and cough, augmenting the difficulty of breathing, and occasioning a sensation of choking in attempting to swallow. These symptoms were not relieved by blood-letting, the application of leeches, and free doses of hyoscyamus and opium. Restlessness, and agitating dreams ensued; and the respiration being more and more impeded, by the increasing disease in the respiratory tube, he sunk calmly, in the full possession of his faculties, and in his accustomed serenity of mind, under the roof of his father, and in the presence of his afflicted wife and mother, on the 27th of September 1814, in the thirty-fourth year of his age.

The regret which followed this event at Norwich was great

and universal. Expressions of sorrow and esteem occupied the columns of the public journals; the Philosophical Society adjourned its subsequent meeting, on the motion of the president, after a warm eulogium had been pronounced on his character by the gentleman who seconded the motion; and his loss was widely lamented in private by those who knew his worth, and both by the rich and the poor who had experienced his kindness and sympathy in the hour of sickness. Indeed, in whatever view his character is contemplated, it was calculated to call forth these testimonials of attachment, and to live in the recollection of all who knew him.

Possessed of a vigorous understanding and great acuteness, he had stored his mind with the riches of literature and science, and had highly cultivated his taste. He quickly appropriated the information which reading, observation, or the most casual conversation threw in his way, and as readily brought it into use when occasion required it. Hence his conversation was various and intelligent, tempered by a mildness of voice and manner, indicative of gentleness of disposition, yet invariably terse and animated, with a considerable propensity to humour, where the subject admitted of it. His unvarying cheerfulness and benevolence of temper, indeed, gave a charm to every action of his life; it extorted the attachment of strangers, and riveted the love of his friends; for it was uniform and unchanged under all circumstances; in the privacy of the domestic circle, in the more general company of friends, in public meetings, and in the midst of his professional labours and fatigues; and it continued, to a degree truly remarkable, through the whole course of his lingering and painful illness, to the very period of its termination. His unaffected benevolence and neverfailing zeal, led him, as we have seen, to incessant exertions in the cause of humanity, even while his own health and comfort were impaired; and it was remarked, that he uniformly appeared to be the least oppressed by his own malady, when he was called upon to administer to the relief of others.

The opinions of the generality of men, respecting the great questions of politics and religion, are modelled by those of the circle in which they happen to move; but those of Dr. Reeve were not adopted without much reflection, aided by a sound

judgment, and a considerable knowledge of mankind, and were of a highly liberal character. Being always the zealous friend of truth and justice, his wishes were ever on the side of liberty, both civil and religious; he held in abhorrence all systems of fraud and oppression, and detested the attempts of bigotry and superstition, to throw shackles over the human mind. Nevertheless, he held these opinions in the spirit of benevolence, and adhered to no party; being willing to hope, that those who differed from him were actuated by similar motives, and in pursuit of the same objects with himself, however mistaken in the rites which they practised. With such views and dispositions, his duties in private were necessarily performed with the same correctness and zeal, as those of his public and professional life. By the judicious estimate of the true value of domestic happiness, indeed, he had early sacrificed the more captivating allurements of ambition and fame in the metropolis; and in the enjoyment of this choice, he evinced, in the character of husband, father, and friend, how much he was destined to promote the felicity of those around him. In short, to borrow the words of a public memorial of him, "his duties in private life were no less happily discharged than those of his profession; his mind was open, generous, lively, simple, and affectionate; and those to whom he was united, as a relative, or a friend, will ever turn with melancholy complacency to the remembrance of his faithful and active attachment, of his cheering conversation, and of his pleasing and valuable accomplishments."

In order to avoid any interruption in the narrative of his indisposition, we omitted to state, that, upon the completion of a large building, intended as a lunatic asylum for the county of Norfolk, in the spring of 1814, Dr. Reeve was appointed physician to it, in conjunction with Dr. Wright,—a measure which was proposed by themselves, with the view of avoiding the pain of a contest, where their claims appeared to be nearly equal. We should also add, that he was elected a Fellow of the Linnean Society, probably about the year 1806, and on settling at Norwich, he became an extra-licentiate of the College of Physicians in London.

In addition to the literary productions already mentioned, several papers were furnished by Dr. Reeve to this Journal;

namely, an Account of some Cases of Tumour in the breast, Vol. I. p. 159: six of the anonymous papers entitled "the Inquirer," besides the one already noticed, numbered 14, 17, 18, 20, 21, and 22, and including disquisitions relative to the "conversion of diseases," pointed out by Dr. Ferriar; the causes of stone and gravel, the deaf and dumb, diabetes, and some miscellaneous subjects, under the title of "Medical Gleanings." The eighth volume of the Journal also contains an essay from him on the treatment of chorea, and a brief account of the German Universities. We may also state, that in the second volume of the late Dr. Currie's "Reports on the effects of water, cold and warm," &c. a communication was published from Dr. Reeve, containing an account of the effects of cold affusion, which was used for the first time at Edinburgh, by Dr. James Home, in the clinical wards of the Infirmary, while he was a student there.

B.

ORIGINAL PAPER.

TO THE EDITORS OF THE ECLECTIC REPERTORY.

Description of a New Self-Registering Thermometer.

Contrived by EDWARD CLARK, of Philadelphia. March, 1816.

THERE are few subjects, perhaps none, in which we feel ourselves more deeply interested than in meteorology; since, on the modifications and changes, that are constantly taking place in the heterogeneous fluids which compose our atmosphere, not only the health and life of man, but the very circumstance of all organized beings depend. Hence a knowledge of it is desirable, and its study exceedingly interesting; particularly, as by keeping circumstantial records of the changes that recently and remotely occur, and comparing them, we are enabled to ascertain the revolutions in climate that happen in similar latitudes or in the same place, as also what precise climate is best adapted for any particularly depending effect; and when they influence our health and consequently our happiness, to detect and often remove the causes.

To render the pursuit of some of the branches of this science easy and intelligible, it became necessary to establish points, from which comparative deductions were to be drawn. With this view various instruments or guages have been made; of which the small mercurial thermometer for the measurement of disengaged or free caloric is perhaps the most perfect; but even with this, the extremes of *heat and cold* could not be known without constant observation. To obviate a task so irksome, and at the same time to ascertain the maximum and minimum of temperature with precision, thermometers, calculated to register the extremes, were constructed; but which, from their liability to errors, did not answer the designed purpose. Nevertheless, the object appearing attainable, I lent it some attention, and the result, as far as I have tried, exceeds my expectations; but the most experienced and careful are sometimes deceived and commit errors; and as my claim to those qualities is very limited, I shall decline attaching any importance to the discovery, at least till time and further ex-

periment has more fully tested it. The promotion of this object is the reason, and I hope will be a sufficient apology for requesting you to publish my plan. Others who have more leisure than myself, and who are better qualified to judge of its utility, may perhaps construct one and give it a full trial. Hoping, that such may be the case, I send you a rough sketch, accompanied with explanations and remarks, which I believe are sufficiently clear to enable almost any person to construct, or direct the construction of one.

The entire drawing represents a verticle-sectional, and skeleton view of the Thermometer.

A.—Represents the superior part of the bulb of the thermometer filled with alcohol, atmospheric air, or some other greatly expanding fluid, which being compressed by balances the mercury *C. C.* contained in the tube *B.* and in the lower part of the bulb; it is also designed for the expanding medium.

B.—A glass tube curved in the upper part to a semicircle. The lower part is closely cemented in the mouth of the bulb, and passes very near its bottom.

C. C.—Mercury in the bulb and tube, which serves as a vehicle to sustain *D.*

D.—An iron ball, floating on the surface of the mercury in *B.*

E.—A magnetic needle playing on the pivot *I.*

F.—The main hand connected to the needle at the pivot *I*, and pointing across the ball *D*, to the index *K.*

G. G.—Two very delicate hands moving on the pivot *I.* and unconnected with any other part of the thermometer.

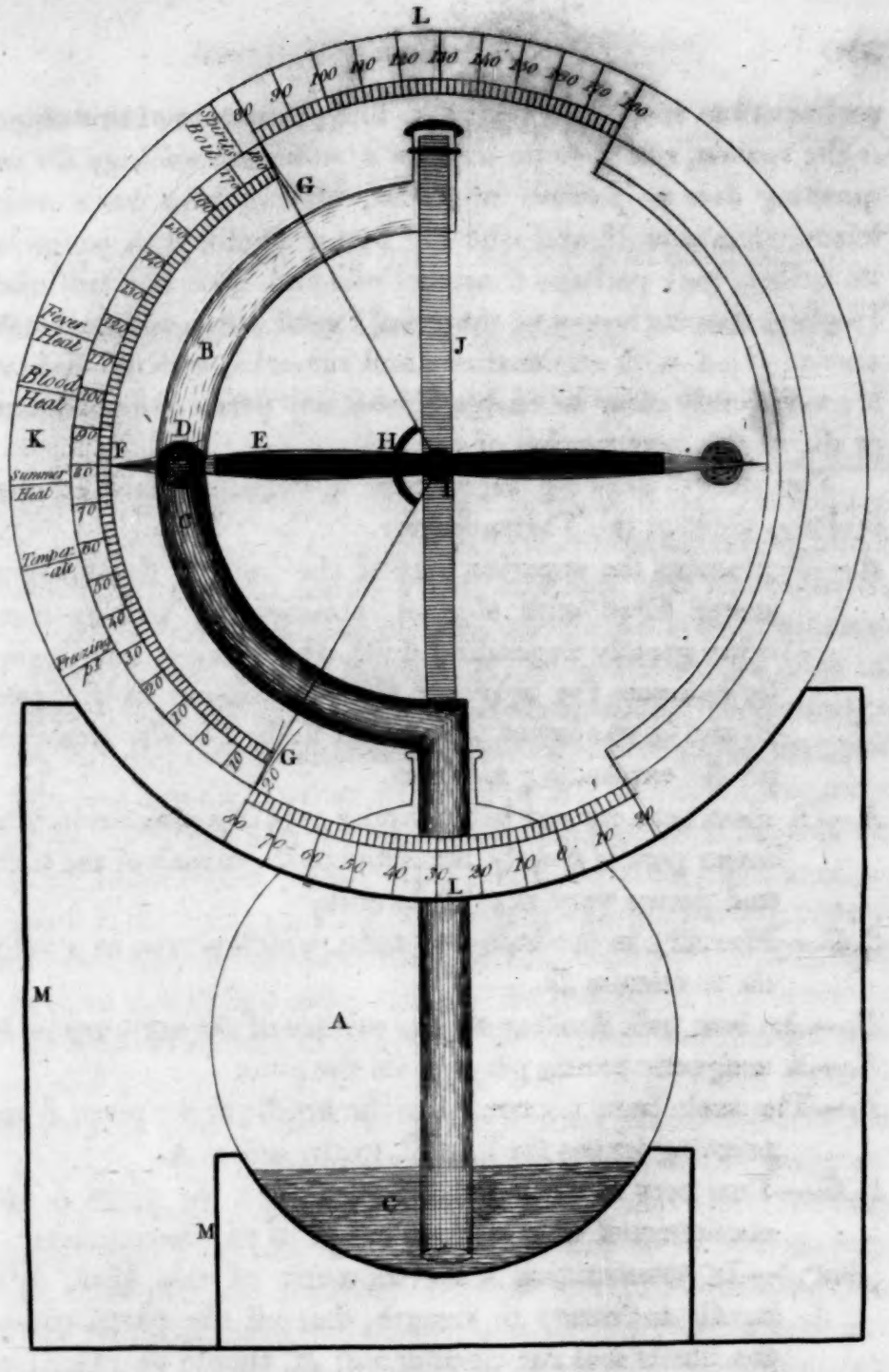
(*Note.*)—In constructing a thermometer of this kind, it is hardly necessary to remark, that all the parts, except the hands and the circular rod *H*, should be placed at the back of the face containing the index.

H.—A small circular rod connected to the main hand, and as that moves up or down, intended to move the small hands along with it.

I.—A pivot placed into the centre of the circle, of which the curved end of the tube forms a part.

J.—A support, fastened to the tube or neck of the bulb, in which the pivot *I*, is secured.

K.—An index, adjusted to Fahrenheit's thermometer.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Fever Heat
Blood Heat
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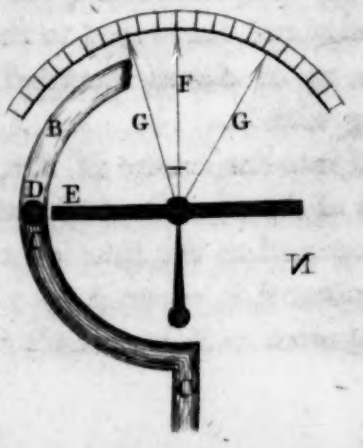
F
B
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C

VI

L. L.—An index divided, but corresponding with *K.* to which the small hands point. This index, as will be seen by the sketch *N*, is not essential.

M. M.—The case which covers and supports the thermometer.

N.—A different arrangement of the hands, by which one index is sufficient. For a description of which, refer to *B.*, *C. C.*, *D.*, *E.*, *F.*, and *G. G.*, as before represented.

The *modus operandi* is so simple as hardly to require a description; for if by the increase or diminution of temperature the mercury in the tube rises and falls, it is evident that the needle will always (from the influence of the magnetic fluid or principle,) point to the centre of attraction within the iron ball floating on its surface; and as the main hand is attached to the needle, it will indicate such changes at the index. The two small hands being brought in contact with the circular rod connected to the main hand, will always be farther separated from each other, as that may rise or fall, and allowance being made for the resistance, show the extremes of those changes. The index should correspond with the movements of the needle and main hand by themselves; then the resistance of the small hands may be readily calculated by any other thermometer with a similar index. As the small hands do not recede, they must, to give a diary of the changes, be daily adjusted.

For the small hands, rings or springs constructed to slide on a wire, &c. may be substituted for registers, but that which moves with the least resistance, should be preferred. If a common sized Florence flask be used for a bulb, and alcohol for the expanding medium, the caliber of the tube should be about four and a half or five lines in diameter, varying according to the size of the flask; when a fluid more expansible than alcohol is used, the diameter should be increased; the most expansible is preferable, as it enables the use of a greater attracting power. This kind of thermometer is not very sensible, but is much more so, than at first would be supposed.

When atmospheric air, or any other compressible fluid, is used for the expanding medium, the tube should be hermetically sealed; under other circumstances, a cork will be found sufficient to protect the mercury from dust and the action of oxygen.

Care must be taken that it always be kept in a perpendicular direction; for if any portion of the expanding fluid be suffered to escape, it will be necessary to add more mercury, or re-adjust the index. It may be plainly or ornamentally cased; and will, I have no doubt, if care be taken in the construction, answer the designed purpose.

We are indebted to a respectable philosophical friend for the following remarks.

Mr. Clark's thermometer for registering the two extremes of temperature within any given period, may serve very well as another variety in addition to those already made for the same purpose. It may, however, be remarked:

1. The magnetic needle, which is used as an index, will be, in some measure, affected by the general attraction of magnetism, as well as by that of the iron ball, which will affect its accuracy.
2. Unless the iron ball be of considerable magnitude, its action on the index will be very feeble, provided this be not very light, in which case its mechanical action on the moveable hands *G. G.* will be scarcely sensible.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Small-Pox and Vaccination.

THE small pox re-appeared in this city about the beginning of December last, after an absence of several years. About 30 persons have died of this loathsome disease.—Much public interest has been excited in order to put a stop to its ravages, by endeavouring to promote a general vaccination. For this purpose Ward meetings have been held throughout the city. Meetings of the inhabitants of the district of Southwark, and of the Northern Liberties, have also been called for the same valuable purpose.

The exertions of the Vaccine Society for vaccinating the poor at their own habitations, have been laudably increased; so that we may reasonably hope that an effectual stop will be put to this terrible disease, and that the present warning will serve to excite our fellow citizens in future, to a constant attention to the necessity of having their children vaccinated at an early age.

Native Epsom Salt.

Louisville, (Kentucky,) Feb. 12, 1816.

It gives us much pleasure to inform our readers of the discovery of an extensive cave of native Epsom salt, or sulphate of magnesia, about thirty-six miles from this place, near the town of Corrydon, (Indiana Territory.) The cave is apparently inexhaustible; salt, of every variety of crystal, is arranged in all that fanciful splendor which decorates the grotto of Antiparos. This cave is the only specimen known of the pure salt in a solid form, except in Monroe county, (Virginia) where it is found under the surface of the earth. In Europe, and particularly in England, at the Epsom springs, which give name to the salt, it is obtained from water impregnated with it. We cordially hope that this native treasure will richly reward the chemical knowledge and enterprize of Doctors Burrel and Adams, of this town; who have the merit of analyzing and ascertaining this gentle and delightful cathartic. We have been promised some further particulars of the situation, dimensions, &c. of the cave, which will shortly be presented to the public.

Earthquakes.

Two smart shocks of an earthquake were felt in Weston, Massachusetts, between the hours of two and five o'clock, in the morning of the 15th Feb. 1816, supposed to be much more violent and of longer duration, than that of last winter. They were accompanied by the same undulatory motion and noise, which characterize the earthquakes of this part of the world. We have anxiously sought in some of the papers for some accounts of these phenomena, expecting to ascertain their extent and comparative violence in other parts. As no notice appears to have been taken of them in the public papers, it is presumed they were confined to this vicinity. At the time of the earthquakes, the air was calm and intensely cold. Many were awakened from sleep by the motion of their houses, or by the peculiar noise attending it. On the day following, fissures or cracks were discovered in the earth, extending to a great distance, and branching in various directions. Some of these cracks were ascertained to be several feet deep, and were it not for the extreme hardness of the earth, their depth might have been more accurately ascertained.

The writer has not been able to learn if such appearances are ever produced by extreme cold, and is therefore at a loss to determine, whether these extensive cracks are the *causes* or the *consequences* of the earthquakes. It is hoped that some person, more experienced in such phenomena, will communicate his observations to the public. If they answer no other important purpose, they may serve to amuse the curious in geology.—*Weston, Feb.* 19.

[The above Earthquakes were noticed at Sudbury and Framingham. At the former place the ground opened as at Weston. An earthquake was felt at Framingham and Sudbury about four months since, at ten o'clock in the morning.]

Retreat for the Insane.

At the present time, when a considerable degree of interest is excited respecting the treatment of insane persons, and when the government of our country has made it a subject of legislation, it is presumed that any account of existing institutions,

which may throw light on the method of treating this deplorable class of our fellow-creatures, may be desirable.

The 19th report of the institution established at York in the year, 1796, for the reception of Insane Persons of the Society of Friends, and which is under their control, will, we doubt not, be acceptable to our readers.

"In concluding the 19th report of the state of the Retreat, the directors can hardly refrain from expressing the feelings of gratitude and satisfaction, with which they contemplate the prosperous state of this institution; the benefits which have resulted from it, to the immediate objects of its care, and the stimulus which its example has given to the improvement of establishments for similar purposes.

"Fourteen patients have been admitted since last year. In the same period, ten have been discharged, recovered, and three in an improved state. Two patients have died, one aged about 80, and the other 78 years.

"There are now 63 patients under care, viz. 25 men and 38 women, of whom 4 men and 7 women are at the appendage.

"From the opening of the Retreat to the end of the year 1814, 177 patients were admitted, of whom 100 had been disordered more than 12 months. Of these latter cases, which are generally denominated incurable, 26 have been happily restored to society; and of the 77 recent cases, 59 have been so restored.

"It is also worthy of remark, as affording satisfactory evidence of the good management of the institution, and of the importance of early attention to cases of insanity, that of the 16 recent cases admitted in the last three years, 15 have already been discharged recovered.

"The directors cannot but attribute, under the divine blessing, much of the prosperity and success of this institution to the openness with which its affairs have been conducted; the uniform interest for its welfare evinced by its patrons and managers; and, in an eminent degree, to the conscientious and judicious discharge of the arduous duties, by the persons who have, for so many years, had the immediate superintendence and management of the establishment.

"A steady attention to these causes of success, they trust will long support the character and usefulness of the Retreat,

and insure a continuance of that liberality by which it has hitherto been supported."

Many judicious remarks, as regards the peculiar mode of treatment, resorted to in the above institution, may be collected from a volume lately published by S. Tuke, entitled, "Description of the Retreat," &c.—*London Times, Aug.* 1815.

Royal Society of London.

This society have just published the first part of its Transactions for 1815, and the following are its contents:—

Additional Observations on the optical Properties and Structure of heated Glass and unannealed Glass Drops; by Dr. Brewster.

Description of a new Instrument for performing mechanically the Involution and Evolution of Numbers; by Dr. Roget.

Experiments on the Depolarization of Light as exhibited by various Mineral, Animal, and Vegetable Bodies, with a Reference of the Phenomena to the general Principles of Polarization; by Dr. Brewster.

On an ebbing and flowing Stream discovered by boring in the Harbour of Bridlington; by Dr. Storer.

On the Effects of simple Pressure in producing that Species of Crystallization which forms two oppositely polarized Images, and exhibits the complementary Colours by polarized Light; by Dr. Brewster.

Experiments made with a View to ascertain the Principle on which the Action of the Heart depends, and the Relation which subsists between that Organ and the Nervous System; by Dr. Philip.

Experiments to ascertain the Influence of the Spinal Marrow on the Action of the Heart in Fishes; by Mr. William Clift.

Some Experiments and Observations on the Colours used in Painting by the Ancients; by Sir Humphrey Davy.

On the Laws which regulate the Polarization of Light by Reflection from transparent Bodies; by Dr. Brewster.

On the 25th of May, a paper by Dr. Parry was read to the Society, *on the Nature and Cause of the Pulse.* Dr. Parry took

a review of the different theories which have been proposed to account for the phenomenon of pulsation, observing that the greater part of physiologists had contented themselves with the opinion of Haller, that pulsation was occasioned by the diastole and systole of the heart. His view, however, of the question, is much simpler; on examining different arteries where they were exposed to no obstruction or pressure, he found that they had no pulse: by pressing the finger on an artery over a soft part of the body, which yielded sufficiently to the pressure, no pulse was manifested; but, whenever an artery was pressed over a solid part, then a pulse was immediately found. He repeated these operations several times, and uniformly found the same effects. Hence he concludes, that the pulse is nothing more than the re-action or impetus of the blood to maintain its regular motion. The arteries appear only as canals through which the blood flows in an uniform and continuous current; diminish the diameter of the canals, and a pulse is immediately perceived. At every junction of a vein with an artery, the internal diameter of the latter is diminished, and hence a pulse always appears. This Dr. Parry thinks fully adequate to account for all the modifications of the pulse.

J. G. Children, Esq. submitted to the Society, a description of his very large galvanic battery, each plate of which consisted of thirty-two square feet, and related the effects of a great number of experiments made with it in producing intense heat, in melting metals, &c. One experiment was on iron. He and Mr. Pepys took a piece of soft iron, made a cavity in it to hold some diamond powder, and then submitted it to the action of the galvanic battery; when the iron was instantly converted into blister steel, and the diamond entirely disappeared. This experiment, the author concluded, was quite satisfactory to prove that the diamond contains nothing but pure carbon.

London Monthly Magazine, Aug. 1815.

ROYAL SOCIETY.

The Philosophical Transactions for 1815, *Part II. have appeared, and contain the following papers.*

On some Phenomena of Colours, exhibited by thin plates; by John Knox, Esq.

Some further Observations on the Current that often prevails to the westward of the Scilly Islands; by James Rennell, Esq. F. R. S.

Some Experiments on a solid Compound of Iodine and Oxygen, and on its Chemical Agencies; by Sir H. Davy, L. L. D. F. R. S.

On the Actions of the Acids on Salts, usually called Hyperoxymuriates, and on the Gases produced from them; by Sir Humphrey Davy.

Further Analytical Experiments relative to the constitution of the prussic, of the ferruretted chyazic, and of the sulphuretted chyazic acids: and to that of their salts; together with the application of the atomic theory to the analyses of these bodies; by Robert Porrett, Jun. Esq.

On the Nature and Combinations of a newly discovered Vegetable Acid: with observations on the malic acid, and suggestions on the state in which acids may have previously existed in vegetables; by M. Donovan, Esq.

On the structure of the Organs of Respiration in Animals, which appear to hold an intermediate place between those of the Class Pisces and the Class Vermes, and in two genera of the last mentioned class; by Sir Everard Home, Bart. V. P. R. S.

On the mode of generation of the Lamprey and Myxine; by Sir Everard Home, Bart. V. P. R. S.

On the multiplication of Images, and the Colours which accompany them in some specimens of calcareous spar; by David Brewster, L. L. D. F. R. S. Lond. and Edin.

A series of Observations of the Satellites of the Georgian Planet, including a passage through the node of their orbits; with an introductory account of the telescopic apparatus that has been used on this occasion: and a final exposition of some calculated particulars deduced from the observations; by William Herschel, L. L. D. F. R. S.

An account of some experiments with a large Voltaic Battery; by J. G. Children, Esq. F. R. S.

On the dispersive power of the atmosphere, and its effect on astronomical observations; by Stephen Lee.

Determination of the North Polar distances and proper motion of thirty fixed stars; by John Pond, Esq. Astronomer Royal, F. R. S.

An essay towards the Calculus of Functions; by C. Babbage, Esq.

Some additional Experiments and Observations on the relation which subsists between the nervous and sanguiferous systems; by A. P. Wilson Philip, Physician in Worcester.

London Monthly Magazine, for January, 1816.

A few months since we noticed Mr. Carpue's successful restoration of the nose of Capt. Williamson, and we have now the pleasure to state, that he has since succeeded in performing a similar operation on Capt. Latham. The same eminent surgeon has recently extended the principle, and has restored an entire lower jaw to an officer who had lost it in battle, by uniting the integuments of the neck with those of the under part of the face. *Id.*

Sir Everard Home has published some interesting observations on the influence of the nerves upon the action of the arteries. That the pulsations of the arteries correspond in their frequency with the contractions of the left ventricle of the heart, is, says he, universally admitted; and those pulsations continuing in the arteries after the limb to which they belong is rendered paralytic, has led to the belief, that all arterial action is independent of nervous influence; but he proves, that the nerves which accompany the arteries regulate their actions, and it is through their agency that the blood is distributed in different proportions to the different parts of the body. He ascertained by experiment, that the increase and the diminution of the action of an artery does not depend upon irritability, but nervous influence; and this influence of the nerves upon the arteries throws, he says, considerable light upon some of the most important actions in the animal economy.

By its means, the same arteries, at different times, allow very different proportions of blood to pass through them, and those employed in furnishing blood for the secretions have the supplies regulated; which explains the use of the system of nerves with which the blood-vessels of the viscera are so abundantly furnished. On this dominion of the nerves over the actions of arteries depends the growth of the body, the regeneration of parts in those animals, in which it occurs, as lizards and others, and the formation of tumours of all the different kinds. The circulation of the blood is therefore no longer to be considered as wholly dependent upon the heart and the elasticity of the arteries; for, although by these alone it can be kept up, the action of the nerves is necessary to regulate the distribution of the blood to the different parts of the body, according as supplies are wanted to carry on the necessary operations of the animal œconomy.

Abstract of the Bill of Mortality, for the city and precincts of Baltimore, from the first of January, 1815, to the first of January, 1816.—Agreeably to the Record kept in the Office of the Commissioners of Health.

	Males.	Females	Total.
January,	69	52	121
February,	53	48	101
March,	58	41	99
April,	73	66	139
May,	39	47	86
June,	48	36	84
July,	66	55	121
August,	75	68	143
September,	70	59	129
October,	46	48	94
November,	68	47	115
December,	77	40	117
	742	607	1349

Ages.				
Under	1 year		-	448
From	1 to	2	-	73
	2 to	3	-	35
	3 to	5	-	57
	5 to	10	-	70
	10 to	20	-	192
	20 to	30	-	174
	30 to	40	-	107
	40 to	50	-	58
	50 to	60	-	47
	60 to	70	-	37
	70 to	80	-	37
	80 to	90	-	8
	90 to	100	-	5
	100 to	110	-	1
			Total,	1349

The Deaths above were caused by Diseases and Casualties as follow:

Apoplexy,	5	Jaundice,	3
Asthma,	2	Liver Inflammation,	9
Bleeding,	1	Lock Jaw,	3
Cancer,	3	Mortification,	5
Casualties,	21	Measles,	8
Consumptions,	218	Murder,	2
Croup,	47	Old Age,	83
Cholic,	8	Palsy,	5
Child-birth,	22	Pleurisy,	108
Cholera Morbus,	167	Poison,	1
Drowned,	23	Putrid Sore Throat,	2
Dropsy,	34	Quinsy,	5
Dysentery,	7	Rheumatism,	2
Fever, Bilious,	67	St. Anthony's Fire,	3
Typhus,	85	Suicide,	4
Intermitting,	5	Still born,	96
Nervous,	1	Sudden,	9
Fits,	98	Teething,	9
Flux,	6	Thrush,	2
Hooping Cough,	9	Unknown,	60
Hives,	1	Worms,	75
Insanity,	3		
Influenza,	25	Total,	1349

By order of the Board of Health,

P. G. HANDS, Secretary.

Bill of Mortality, in New Haven, Connecticut, from January 1, 1815, to January 1, 1816.

Deaths in each Month.		*Ages.*	
January,	6	Under 5 years,	121
February,	6	From 5 to 10	18
March,	7	10 to 20	15
April,	8	20 to 30	7
May,	7	30 to 40	15
June,	5	40 to 50	7
July,	13	50 to 60	9
August,	38	60 to 70	9
September,	73	70 to 80	11
October,	21	80 to 90	0
November,	20	90 to 100	1
December,	9		
Total.	213	Total,	213

The number of Deaths in 1814, 100; in 1813, 228.

FOR THE ECLECTIC REPERTORY.

Statement of Deaths, with the diseases and ages, in the City and Liberties of Philadelphia, from the 1st of January 1815, to the 1st of January 1816.

DISEASES.	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Aphtha	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Asthma	0	0	0	0	0	0	1	1	0	3	0	2	0	0	7
Abscess	2	0	0	1	0	0	1	0	0	0	0	0	0	0	4
Aneurism	0	0	0	0	0	1	0	0	2	0	0	0	0	0	3
Apoplexy	0	0	0	0	0	2	6	6	20	6	3	6	1	0	50
Atrophy	4	1	2	0	2	2	2	5	0	7	2	1	1	0	29
Angina Pectoris	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Burns	5	3	4	3	0	0	0	0	0	1	0	0	0	0	14
Cancer	0	0	0	0	0	0	1	2	3	1	1	1	0	0	9
Casualties	2	0	0	1	3	3	3	3	0	1	0	0	0	0	16
Catarrh	4	4	3	0	0	1	3	1	2	3	0	0	0	0	21
Child Bed	0	0	0	0	0	3	2	2	0	0	0	0	0	0	7
Cholera Morbus	57	26	6	3	0	1	0	1	0	0	0	0	0	0	94
Colic	1	2	0	0	1	5	4	2	3	0	0	0	0	0	18
Consumption of the Lungs	0	4	7	16	80	103	54	47	25	8	3	0	0	0	347
Convulsions	144	13	4	6	0	1	8	3	1	0	0	0	0	0	180
Caries	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3
Cachexy	0	0	0	0	0	1	1	1	0	0	0	1	0	0	4
Contusion	1	0	1	0	0	0	4	0	0	0	0	0	0	0	6
Decay	7	4	5	6	3	7	4	3	13	3	7	1	0	0	63
Diarrhœa	8	2	2	0	6	3	1	2	7	1	1	0	0	0	33
Dropsy	1	1	5	0	2	6	11	9	8	7	3	0	0	0	53
of the Breast	2	1	1	4	1	5	3	0	2	0	0	0	0	0	19
in the Brain	31	11	7	10	1	3	0	1	0	1	0	0	0	0	65
Drowned	0	1	2	3	2	3	10	9	2	2	0	0	0	0	34
Dysentery	6	6	7	4	2	4	2	5	2	6	0	0	0	0	44
Drunkenness	0	0	0	0	0	0	2	0	4	1	0	0	0	0	7
Disease in Hip Joint	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Debility	15	2	1	1	0	2	7	8	1	5	8	2	0	0	52
Epilepsy	0	1	0	1	1	0	1	1	0	0	0	0	0	0	5
Erysipelas	0	1	0	0	0	2	1	3	0	0	0	0	0	0	7
Eruption	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Fracture	0	0	0	0	1	0	1	2	0	0	1	0	0	0	5
Fever	5	2	4	1	5	4	6	5	0	0	2	1	0	0	35
Intermittent	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Remittent	0	0	4	1	2	3	2	3	0	3	1	1	0	0	20
Bilious	0	2	1	0	0	4	6	6	0	1	0	0	0	0	20
Nervous	0	0	0	1	1	2	2	2	0	0	0	0	0	0	8
Malignant	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Typhus	3	0	2	0	7	22	21	14	10	5	0	0	0	0	84
Puerperal	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
Hectic	0	0	0	0	0	0	2	0	0	1	0	0	0	0	3
Inflammatory	0	0	0	0	0	0	4	1	0	0	0	0	0	0	5
Gangrene and Mortification	2	0	1	0	1	0	2	3	1	2	0	0	0	0	12
Gout	0	0	0	0	0	0	0	1	2	1	0	0	0	0	3
Gravel	0	0	0	0	0	0	0	1	1	0	1	0	0	0	4
Hooping Cough	3	1	1	1	0	0	0	0	0	0	0	0	0	0	6
Hives	9	2	7	1	0	0	0	1	0	0	0	0	0	0	20
Carried over,	311	91	79	66	124	196	179	156	109	69	33	16	2	0	1431

	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Brought forward,	311	91	79	66	124	196	179	156	109	69	33	16	2	0	1431
Hernia	0	0	0	0	0	1	1	0	1	1	2	0	0	0	6
Hæmorrhage	0	1	0	0	1	1	3	1	1	0	0	0	0	0	8
Inflammation of the Brain	3	2	2	3	9	0	2	0	0	0	0	0	0	0	21
of the Lungs	1	1	1	0	1	1	1	2	0	1	0	0	0	0	9
of the Stomach	5	2	2	4	2	3	3	6	3	3	2	0	0	0	35
of the Bowels	2	2	0	0	0	1	1	4	3	1	0	1	0	0	15
of the Liver	0	6	0	0	1	3	3	3	3	1	0	1	0	0	21
Insanity	0	0	0	0	0	7	14	6	4	2	3	0	0	0	36
Jaundice	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
Locked Jaw	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4
Measles	1	3	2	0	1	0	0	0	0	0	0	0	0	0	7
Murdered	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Old Age	0	0	0	0	0	0	0	0	1	1	19	25	13	1	60
Pleurisy	11	3	2	3	2	20	11	40	11	12	8	3	0	0	126
Palsy	0	0	0	0	0	3	3	3	2	5	4	1	0	0	21
Rheumatism	0	0	0	0	0	2	3	3	2	1	0	1	0	0	12
Scrofula	2	2	6	1	0	4	3	0	1	0	0	0	0	0	19
Sore Throat	4	0	0	4	3	0	1	1	1	0	0	0	0	0	14
Still Born	97	0	0	0	0	0	0	0	0	0	0	0	0	0	97
Suicide	0	0	0	0	0	2	1	1	1	0	0	1	0	0	6
Sudden	5	0	0	0	0	6	8	8	6	3	0	0	0	0	36
Syphilis	1	0	0	0	0	1	3	2	0	0	0	0	0	0	7
Strangury	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Teething	3	2	2	1	0	0	0	0	0	0	0	0	0	0	8
Tabes	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Ulcers	1	0	0	0	0	0	0	0	2	0	1	0	0	0	4
Worms	3	1	0	5	1	0	0	1	0	0	0	0	0	0	11
Unknown	5	0	0	1	0	2	5	1	3	3	0	0	0	0	20
Total,	455	116	97	89	147	254	249	238	155	103	72	49	18	1	2040

NOTE. Of the above there were 763 males of twenty years and upwards, 371 under twenty years: of females, 490 of twenty years and upwards, 284 under twenty years, and 132 children, principally under one year, whose sex is unknown.

Deaths in each month of the above period.

	Adults.	Children.	*Total.*
January	88	43	131
February	70	52	122
March	116	66	182
April	113	49	162
May	99	58	157
June	126	71	197
July	78	75	153
August	124	102	226
September	90	85	175
October	105	64	169
November	119	58	177
December	122	67	189
Total	1250	790	2040

By order of the Board of Health,

JOHN ALLISON, Clerk.

Health Office, February 14th, 1816.

Bill of Mortality, as observed and reported by Isaac Ball, M. D. Assistant in the Board of Health of New York, commencing January 1st, and ending Dec. 31, 1815.

	Consumption.	Small-pox.	Various Diseases.	Total.
January,	43		105	148
February,	46		118	164
March,	49		118	167
April,	65		149	214
May,	66		161	227
June,	60		117	177
July,	29		132	161
August,	63	2	180	245
September,	46	3	183	232
October,	43	8	177	228
November,	54	18	105	177
December,	56	62	161	279
	620	93	1706	2419

Variola, (small-pox,) varicella, (chicken-pox, &c.) have prevailed in the city and suburbs of New-York. The first has been attended with great mortality, and by the number of its victims (about one hundred and ninety,) it has certainly proved that vaccination is either much neglected, or not universally resorted to for prevention. Not a single instance of failure, however, has been heard of, that has been attended with fatal small pox.

Of this loathsome disease Sydenham has witnessed the great influence or agency of the atmospheric constitution, to propagate and extend its ravages, at different periods of time, with aggravated symptoms, which seemed to constitute various sorts of small-pox. (Vide Syd. by Rush, sec. iii. c. 1.) Hence, besides its casual introduction from abroad, the keeping of variolous matter by physicians, or other persons, even for practical use or experiments, is much to be deprecated as an additional cause of danger. At this late period (January 30,) we cannot foretel, amidst so large a population, how and when it will be extirpated.—*New-York Med. Repository, Feb.* 1816.

FOR THE ECLECTIC REPERTORY.

UNIVERSITY OF PENNSYLVANIA.

APPOINTMENTS BY THE TRUSTEES.

NATHANIEL CHAPMAN, M. D. Professor of the Institutes and Practice of Physic, and of Clinical Medicine.

JOHN SYNG DORSEY, M. D. Professor of Materia Medica.

AT a public Commencement held at the University on the fifth day of April, 1816, the Degree of DOCTOR OF MEDICINE was conferred on the following gentlemen, who submitted the Theses subjoined to their respective names.

From New-York.

Harvey Klapp, ...	On Cholera Infantum.

New Jersey.

John W. Jenks, ...	On Typhus Fever.
Edward Q. Keasby, . . .	On Cataract.
Zaccur Prall, ...	On Dysentery.
Samuel C. Hopkins, . . .	On Typhus Fever.

Pennsylvania.

Charles Lukens, . . .	On Diseases of the Head from Affections of the Stomach.
Stephen Burson, ...	On Sleep.
Thomas J. Davis, . . .	On Hæmoptysis.
Samuel W. Pickering, . .	On the Functions of the Nervous System.
E. Boudinot Stockton, . .	On the Influence of Physical Causes on the Moral Faculty.
Joseph K. Swift, ...	On Rheumatism.
John Harris, ...	On Dyspepsia.
Joseph A. Tate, ...	Account of an Epidemic Dysentery.
Ralph Lee, ...	On the laws Regulating the Temperature of the Body.

James Speer, ... On Leucorrhæa.
Charles C. Beatty, . . . On Hydrocephalus Internus.
Martin Barr, ... On Puerperal Fever.
Samuel C. Thornton, . . On Instinct.

Delaware.

Goveyneer Emerson, . . On Hereditary Diseases.
Nathan L. Boulden, . . On Scrofula.
John L. Morris, ... On Hydrophobia.

Maryland.

Nathaniel R. Tingle, . . On Uterine Hæmorrhage.
Samuel Shuman, . . . On Dropsy.
John Ridout, ... On Pneumonia Typhoides.
James J. Johnson, . . . On Dropsy.

District of Columbia.

Edmund Fitzhugh, . . . On Animal Heat.

Virginia.

Philip W. Spark, . . . On Eupatorium Perfoliatum.
William G. Nice, . . . On the External Application of Cathartics.
Peterson W. Harper, . . On Cynanche Trachealis.
John C. Pegram, ... On the Epidemic of 1815.
William A. O. Brown, . On Typhus Fever.
Alexander Erskine, . . . On Secale Cornutum.
Thomas N. Cameron, . . On Hepatitis.
Joseph Dudley, ... On Typhus Fever.
William H. Robertson, . On Specifics.
Wallace Estell, ... On Typhus Pneumonia.
John G. Crouch, . . . On Scrofula.
Robert G. Mosely, . . . On Amenorrhœa.
William R. M'Caw, . . On Chronic Aphthæ.
Robert B. Honeyman, . . On Dysentery.
Creed Haskins, ... On Typhus.
Samuel C. Dickenson, . . On Cynanche Trachealis.
John T. Garland, . . . On the Physiology of the Skin.
M. S. Watkins, ... On the Modus Operandi of Blisters.

William B. Price, . . .	On Dysentery.
Ferdinand Stith, ...	On Bilious Remittent Fever.
Hartwell Harris, . . .	On the Unity of Disease.
Benjamin Wilkins, . . .	On Hepatitis acuta.
Thomas F. Tebbs, . . .	On the Typhous Epidemic of Virginia.
John W. Royster, . . .	On the Croup.
Richard C. Mason, . .	On Menstruation.
Richard M'Sherry, . . .	On Mortification.
Samuel Scollay, ...	On Dysentery.
John Cabaniss, ...	On Sensation and Motion.
Samuel Shrewsbury, Jun.	On Injuries of the Head.

Kentucky.

Daniel M. Heard, . . .	On Animal Heat.
James Metcalfe, . . .	On Hepatitis.
James Wilson, ...	On Apoplexy.
William I. M'Lees, . .	On Sea Scurvy.

North Carolina.

Thomas R. Ruffin, . . .	On the Anatomy and Physiology of the Egg.
William J. Polk, . . .	On Typhus Fever.
Henry Frost, ...	On the Cold Bath.
Richard Footman, . . .	On Melia Azederach.
Samuel Wilson, Jun. . .	On Digitalis.

Georgia.

Milledge Galphin, . . .	On the Sesamum or Benne.
John L. Wingfield, . .	On Fractures.
Alexander Cunningham, .	On Intermitting and Remitting Fever.
James Tinsley, ...	On Diabetes.

Ireland.

David M'Garry, ...	On Menstruation.

HUMANE SOCIETY.

Philadelphia, March, 1816.

The following Managers were elected for the present year, viz.

Joseph Crukshank,	Samuel Pancoast, Jun.
Charles Marshall,	William Leedom,
Benjamin Thaw,	Matthew L. Bevan,
Dr. Thomas C. James,	William Hembell, Jun.
Dr. Joseph Parrish,	Benjamin Jones, Jun.
Dr. John W. Moore,	Isaac Snowden.

The following Officers of the Institution were chosen by the managers.

Joseph Crukshank, *President.*
Joseph P. Hornor, *Treasurer.*
Isaac Snowden, *Secretary*

Inspectors of the Apparatus.
William Hembell, Jun.
William Leedom.

Committee of Correspondence.
Doctor Thomas C. James,
Joseph Parrish,
John W. Moore.

Botanical Garden.

The Subscribers inform the public, that the Trustees of the University of Pennsylvania are taking measures to establish a BOTANICAL GARDEN, in or near the city of Philadelphia. The funds granted them by the Legislature not being adequate, the public are invited to extend their patronage to this interesting and important object.

A *Botanical Garden*, calculated to afford the highest benefit on the Medical School, the greater facilities to the study and improvement of the Science, and recreation to the citizens at large, requires considerable expense in its establishment, as well as in its subsequent maintenance and improvement.

Subscription papers will be presented in a few days, when the subscribers flatter themselves, the *University of Pennsylvania* will be supported in its efforts to form this establishment, which has long been desired, and which, if accomplished, will be of permanent utility to the city.

Extract from the Act of the Legislature.

"That the sum of *three thousand dollars*, be, and the same "is hereby granted to the Trustees of the University of Penn- "sylvania, for the purpose of enabling them to establish a "Garden, for the improvement of the Science of Botany; and "for instituting a series of experiments to ascertain the cheap- "est and best food for plants, and their *Medical properties and* "*Virtues.*"

William Rawle,
Benjamin Chew,
Edward Burd,
James Gibson,
Horace Binney.
Committee of the Board of Trustees.

Philadelphia, April 10, 1816.

Transactions of the Literary and Philosophical Society of New-York.

A quarto volume of the Transactions of the New-York Literary and Philosophical Society has lately been published. It contains a learned and copious introductory discourse, by the President, Dewitt Clinton, L. L. D.—a Memoir on Comets, by the corresponding Secretary, Hugh Williamson, M. D. and L. L. D.—a Tract on the Laws of Contagion, and the application thereof to Contagious Diseases, by David Hosack, M. D. one of the vice-presidents—Directions for making and registering Meteorological Observations, by John Griscom, Esq. a counsellor of the society—an Analysis of the Mineral Waters at Schooley's Mountain, in New-Jersey, by professor William J. Mac Neven, M. D.—Cases of Morbid Anatomy, with plates, by John W. Francis, M. D. one of the recording secretaries. This volume also contains a

Memoir on the North-American Earthquakes of 1811, 1812, and 1813, and the cotemporaneous commotions in other parts of the world, by Samuel L. Mitchill; and the Description and Classification of nearly one hundred and seventy species of Fish, found in and around New-York, by the same. This ichthyological paper is illustrated, by Dr. Mitchill, with the figures of sixty species of fishes; the principal of which are supposed to be unknown to naturalists; and which may serve to make inquirers somewhat better acquainted with the variety and abundance found in the market of New-York. In this interesting publication, likewise, will be found, a letter of Dr. Clinton to Dr. Mitchill, containing remarks on the fishes of the western waters of the state of New-York; and a letter from James Mease, M. D. to Dr. Hosack, concerning the history, haunts, and manners of the Rock-fish, Striped Basse or streaked Perch, of the United States.

Mineralogy and Geology.

There is now in the press of Cummings and Hilliard, of Boston, an elementary treatise of Mineralogy and Geology, in one volume, of between six and seven hundred pages, by Professor Cleaveland of Bowdoin College. The work will be accompanied with plates, illustrating the structure and actual forms of crystals, and a geological map of the United States.

The work is more especially designed for pupils, for gentlemen attending mineralogical lectures, and also as a companion for travellers; for which purpose, particular attention has been devoted to the designation of all the localities of minerals in the United States. A work of this kind is much wanted, for the assistance of those who are disposed to engage in the study of this useful and interesting science. From the abilities and application of Professor Cleaveland we have no doubt that this work will be executed in a manner to merit the public patronage, which it may be hoped will remunerate him for the study and labour it has required.

Speedily will be published in 2 vols. 8vo. the Institutes and Practice of Medicine, founded on the basis of anatomy, healthy and morbid; and on the well known Laws of the Animal Economy; by Lyman Spalding, M. D. President of the College of Physicians and Surgeons of the University of New-York, for the Western District.

Phosphorus internally used as a Tonic and Stimulant Remedy.

Monsieur D. Lobstein, of the Faculty of Medicine of Paris, has published an historical essay on the discovery of the physical and chemical properties of phosphorus, which is by him now classed among the articles of Materia Medica, with the doses, medical effects, and formulæ.

He attributes the unfortunate experiments formerly made of that substance in the human body, to the improper mode that was resorted to for its exhibition in pills, electuaries, &c. in which it could not be sufficiently divided or diluted. But its solution in vitriolic æther, with the addition of some distilled aromatic oil, is an equally safe and convenient medicine, to be taken at the dose of a few drops at first, to be gradually augmented as the circumstances may require. As a powerful tonic, it becomes eminently useful in asthenic diseases, in which it is desirable to diffuse a momentary, but intense stimulating action. He mentions dangerous cases of typhus and other asthenic fevers, thus radically cured by the use of phosphorus. His *reviewers* express a regret that the association of that ingredient with different auxiliaries, should make it difficult to determine upon its true efficacy. They, however, think the subject highly interesting, and well deserving further experiments.—*Journal de Medicine de Paris, May*, 1815.

OBITUARY.

Lancaster, Penn. April 6, 1816.

Died on the 1st instant, DR. FREDERICK KUHN, in the sixty-ninth year of his age.

He was born in this borough, on the 24th of August, 1748. He was early instructed in the principles of the christian religion, which he professed through life, and adorned by his conduct.

He obtained a polite and liberal education, went through the regular gradations of the schools, graduated as Doctor of Medicine, and rose to a degree of eminence in the profession, to which a sound judgment and uncommon application alone can elevate.

At the opening of the revolutionary war, he engaged in the service of the United States, and therein continued almost throughout the war, among the most eminent and respected of his profession in the army.

When he withdrew from the public service, he made the place of his birth his place of residence and medical practice.

After the establishment of the present Constitution of this Commonwealth, he was appointed one of the judges of the county; and served in that capacity for a number of years, to the satisfaction of the community.

In the practice of Medicine, he was eminent and fortunate. He was universally respected and beloved. His tenderness of the character of others, ensured him the friendly regard of his professional brethren. His diligent attention to those who committed their health to his care, his charity to the poor, his kindness to the afflicted, the amiableness of his disposition, together endeared him to all his neighbours.

Note on the Remarks of the Editors' friend, respecting the Self-Registering Thermometer.

As the scale of the Thermometer must necessarily be adjusted under the "general attraction of magnetism," the only effect on its accuracy will be the variation of the force of this general attraction, which, since its quantum cannot be measured by the nicest experiments, will, I apprehend, be too inconsiderable to sensibly affect its accuracy.

In the experiments I made, the small hands *G. G.*, were not used, but their place was supplied by a very small wire ring, which moved with such ease as to produce no apparent resistance; from this circumstance, if the magnetic needle come nearly in contact with the glass tube, and the iron ball be about four lines in diameter, I think very delicate hands will journey so as to answer the same purpose. E. C.

ERRATUM, in pages 250, 251, & 252, for '*index*,' read *scale*.

Philadelphia, July, 1816.

PROPOSAL

BY

THOMAS DOBSON,

At the Stone House, No. 41, South Second Street,

FOR

PUBLISHING BY SUBSCRIPTION

A Supplement to the Encyclopædia.

THE Encyclopædia forms a General Dictionary, not only of ARTS and SCIENCES; but likewise of every branch of *Human Knowledge*.

The plan of the *Encyclopædia Britannica* (from which the American edition was printed, with large additions) has received the decided approbation of the most competent judges; particularly for its superior method of arrangement in regard to the Sciences; and the publication of five extensive editions of the work in Europe, must be allowed to afford a very satisfactory proof of the favourable opinion of the public at large.

The object of the present work is to supply all material omissions; to continue the *Historical* and *Biographical*, as well as the *Geographical* and *Statistical* information to the present times; and to exhibit the *Arts* and *Sciences* in their latest state of improvement. Thereby forming an important and highly valuable Sequel to the Encyclopædia.—The utility of such a Sequel to the Encyclopædia, a work in so many hands, must indeed appear abundantly evident; but besides that object, it is proper to add, that the Supplement is arranged upon a plan by which it will, *within itself*, afford a comprehensive view of the progress and present state of every department of human knowledge.

To the first volume will be prefixed a Dissertation exhibiting a general view of the progress of *Metaphysical*, *Ethical*, and *Political Philosophy*, since the revival of Letters in Europe, by Dugald Stewart, Esq. F. R. SS. London and Edinburgh; and the second volume will be prefaced with a similar view of the progress of *Mathematical* and *Physical Science*, by Professor Playfair.

The Work is edited in Edinburgh, by MACVEY NAPIER, *Esq. F. R. S. E.; and the following Gentlemen have engaged to honour it with their co-operation:*

Rev. Archibald Alison, LL. B. F. R. S. L. & Lond & Ed.
John Aiken, M. D. F. L. S.
Thomas Allan, Esq. F. R. S. L. and E.
John Barrow, Esq. F. R. S. one of the Secretaries of the Admiralty.
Will. Tho. Brande, F. R. S. L. & E. Professor of Chemistry to the Royal Institution of London.
M. D. Blainville, M. D. Professor of Zoology and Comparative Anatomy, Paris.
Mr. David Buchanan.
Mr. Alexander Chalmers, F. S. A.
John Colquhoun, Esq. Advocate.
Reverend George Cook, D. D.
Andrew Duncan, Junior, M. D. F. R. S. E. Professor of Medical Jurisprudence in the University of Edinburgh.
John Graham Dalyell, Esq. Advocate.
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Mr. Farey, Jun. Draughtsman, London

John Gordon, M. D. F. R. S. E. Lecturer on Anatomy and Physiology.
James Horsburgh, Esq. F. R. S. Hydrographer to the East India Company.
Alexander Henderson, M. D. London.
Alexander Irvine, Esq. F. R. S. E. Advocate, Professor of Civil Law in the University of Edinburgh.
James Ivory, A. M. F. R. S. Member of the Royal Society of Gottingen.
Francis Jeffrey, Esq.
Robert Jameson, F. R. S. E. Professor of Natural History in the University of Edinburgh.
Charles Köenig, Esq. F. R. S.—L. S. Mineralogist to the British Museum.
John Leslie, F. R. S. E. Professor of Mathematics in the University of Edinburgh.
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William Elford Leach, M. D. F. L. S. Zoologist to the British Museum.
William Lawrence, Esq. F. R. S. Surgeon, London.
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Robert Muschet, Esq. Royal Mint, Lond.
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James Pillans, F. R. S. E. Rector of the High School, Edinburgh.
James Cowles Pritchard, M. D. F. L. S.
Peter M. Roget, M. D. F. R. S. London.
Walter Scott, Esq.
Sir James Edward Smith, M. D. F. R. S. President of the Linnæan Society.
Henry Salt, Esq. F. R. S.—L. S.
Mr. Sylvester, Derby.
Mr. Stoddart, London.
William Stevenson, Esq. London.
Thomas Thomson, M. D. F. R. S. L. & E.
John Taylor, Esq. Civil Engineer, London.
Rev. William Turner, Newcastle.
William Wallace, F. R. S. E. one of the Professors of Mathematics, Royal Military College, Sandhurst.

The Publisher, in conclusion, cannot but hope that this Work holds out recommendations of such a kind, as to render it highly acceptable, not only to those who possess copies of the Encyclopædia, but to the Public at large.

CONDITIONS.

The work is expected to be comprised in about five large quarto volumes, printed on excellent paper, with numerous engravings, to be executed by the best artists. The publication will proceed by *parts* or *half volumes*, to follow each other at as short intervals as circumstances will permit.

It will go to press as soon as the progress of the engravings will authorise the printing of the letter press, and will be furnished to the subscribers in boards as speedily as practicable. The price to subscribers will be four dollars and fifty cents for each half volume. Any copies not subscribed for in one month after the publication of the first volume, will be raised to five dollars for each volume in boards. *None will be delivered without being paid for.*